

APRIL 1961

# ROCK

## PRODUCTS

Alamet distills limestone  
to yield magnesium  
page 84



Corson prescribes Research for success  
page 100

Highways wait on Congress page 80



Therm-O-Flex filter by WP  
at plant in Barberton

## Cement makers in Ohio... and in California...agree:



Precipitator by WP at  
plant near Los Angeles

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For an efficient, economical solution to any dust control problem—look to Western Precipitation. WP is uniquely fitted to handle your unique problem—being the one organization that custom designs, engineers and installs ALL types of dust and fume control equipment: Precipitator, Mechanical, Jet-Cleaned Filter, Hi-Temp Filter, scrubbers and engineered combinations.

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TURBULAIRE Scrubbers  
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also: HOLO-FLITE Processors  
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TURBULEX Calciners



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**T**HAT limestone has been crushed once, will be crushed again, then sized, and stockpiled until delivery. A series of nine conveyor belts, working like a bucket brigade, keeps the rock moving through these stages at a steady 400-ton-an-hour clip.

Shut a belt down to repair it—and production would come to a standstill. So the quarry operators insisted on having belts that could handle heavy loads, stand the wear and tear of sharp rocks, take exposure to all sorts of weather.

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In this belt nylon is used for cross threads in the fabric to add extra strength without making the belt stiff and boardy. A belt made with Nyfil fabrics is more flexible, can carry heavier loads farther and higher, has greater impact resistance, and holds fasteners better than a belt made with all-cotton fabrics.

Nine B.F. Goodrich Nyfil belts were installed at the quarry. That was five years ago. Today, they're still going strong, show no sign of wear, have needed no maintenance, no repairs of any kind.

BFG distributors have full information on the Nyfil conveyor belts de-

scribed here. And, as factory-trained specialists in rubber products, they can answer your questions about the many rubber products B.F. Goodrich makes for industry. *B.F. Goodrich Industrial Products Co., Dept. M-985, Akron 18, Ohio.*



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ROCK PRODUCTS, April, 1961

# ROCK

PRODUCTS a Maclean-Hunter publication, Vol. 64, No. 4

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FOREIGN—James H. Bedford, Managing Director, Maclean-Hunter Ltd., Trinidad House, 28/30 Old Burlington St., London, W. 1, England; Georg J. Linder, Representative, Wittelsbacher, Allee 68, Frankfurt Am. Main, Germany.

April 1961

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1½ cubic yard electric P&H loads limestone in quarrying operation.

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... a P&H with patented Magnetorque® increases production and cuts your unit costs

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Whether you're loading rock... digging sand and gravel... stockpiling or general utility work—there's a P&H to fit your requirements. Compare before you buy—see why P&H gives you more production and requires less maintenance... why it pays to standardize on P&H.

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*Washed sand and gravel . . . 250 tons per hour profitably produced by*

## Diamond Stationary Plant



Twin loading hoppers for direct or blend feeding of pit run materials

- 1 Twin traploading hoppers, each with 24" x 3'6" plate feeders
- 3 Lattice-framed plant belt conveyors (30" x 140', 24" x 94', 18" x 50')
- 2 4' x 12', 3-deck screens, spray-bar equipped
- 1 28" water scalping classifying tank with triple collecting flume
- 2 Screw washers 36" x 25'
- 1 Screw washer 20" x 22'
- 2 Wash boxes
- 1 3' cone crusher
- 1 10" x 24" jaw crusher
- 6 Stockpiling conveyors (from 18" x 55' to 20" x 80')

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Diamond Iron Works engineers have helped a new sand and gravel operator design a plant to profitably produce 250 tons of crushed and washed aggregate per hour.

The firm is Parmar Sand, Inc. of Transfer, Pa.

Their Diamond closed circuit plant takes a wide variation of sand and gravel, obtained from two different pits, and turns it into seven basic grades, including both concrete and mason sand.

Parmar's market is broadened further because the close control possible with their Diamond plant assures materials which meet specifications for both highway and

commercial construction in two states.

Another advantage of the plant, in addition to being compact and electrically driven, with all wiring underground, is that it requires very little supervision. And it is designed so that future expansion will require minimum alteration to existing facilities.

In summary, this is another example of how Diamond provided a profit package of high capacity, smooth operation, and low cost. We'd welcome the chance to help you—regardless of the size plant you want. See your Diamond Distributor.

### DIAMOND IRON WORKS

DIVISION

GOODMAN MANUFACTURING COMPANY  
Halsted Street and 48th Place • Chicago 9, Illinois



# Another MARYLAND MATERIALS SUPPLIER banks on the 25-D

**T**WO Northwest Model 25-D Shovels can throw out a lot of sand. Here is the pit of the Campbell Sand Company at Greenbelt, Maryland. These two rigs keep two sand processing units on the jump.

The 25-D is the workhorse of the  $\frac{3}{4}$  yard field. Northwest *made it a real* Rock Shovel. It didn't "just happen". Literally dozens of them in this class of work prove it.

Take a look at it! The solid cast alloy Steel Machinery Bases with Machinery Side Frames cast integrally are massive for a machine of this size. They take the shock of rock digging and eliminate constant rebuilding. The Crowd—different, Dual Independent—an Automatic Crowd plus an Independent Crowd, utilizes force most Independent Crowds waste. Handles the tough digging with greater ease. Makes easy digging easier and gives greater output.

The big Uniform Pressure Swing Clutches let you put *all* the load in the truck. Note there is no spillage in the picture. There is the Feather-Touch Clutch Control that gives the true "feel" of the load in nudging the teeth under a big one or in probing a partly shot ledge of rocks. There is the Cushion Clutch that eliminates the shock overload on operating mechanism, increases cable life, and makes ample power safe.

It's a rock rig through and through with the advantages that assure output—not just for today—but for tomorrow, month after month.

There is lot more to tell you. Details make equipment. Dig into them. A Northwest man is at your service.

## NORTHWEST ENGINEERING COMPANY

1514 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

8-25-26-3

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$\frac{3}{4}$  Yd. to  $2\frac{1}{2}$  Yd.  
Capacity

### PULLSHOVELS

$\frac{3}{4}$  Yd. to  $2\frac{1}{2}$  Yd.  
Capacity

### CRANES

13-Ton to 60-Ton  
Capacity

### TRUCK CRANES

25-Ton and 45-Ton  
Capacity

### DRAGLINES

$\frac{3}{4}$  Yd. to 3 Yd.  
Capacity



You can say... "THEY'RE ALWAYS  
READY TO GO!"

$\frac{3}{4}$  to 3

Cubic Yard Capacity



**SERIES 5000**  
For intermittent operation ...  
relatively low capacity.



**SERIES 6000**  
For continuous operation ...  
moderate capacity.

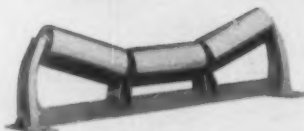
# 759 ways to solve your idler problems

*Link-Belt idlers in standard types and sizes to meet every conceivable belt conveyor need*

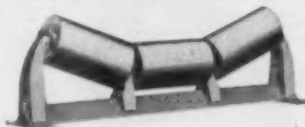
You're sure to find the exact idler to perfectly match your belt conveyor requirements from the complete Link-Belt line of 759 types and sizes.

This broad line enables you to select a size idler that exactly matches your needs, no over- or under-engineering. Power requirements are held to a minimum. In addition, anti-friction bearings, accurate roll alignment and rugged construction provide maximum life for idlers and conveyor belt in light- or heavy-duty service.

Link-Belt idlers are available with end rolls inclined at 20°, 35° and 45° for a broad range of belt widths. Matching lines of troughed belt rubber cushion, troughed belt training, return belt and rubber tread return belt idlers are also available. Call your nearest Link-Belt office or authorized stock-carrying distributor for full details. Look for CONVEYORS in the yellow pages of your phone book. Or write for Book 2716.



**SERIES 7000**  
For continuous operation, higher capacities, heavyweight, abrasive materials.



**SERIES 8000**  
For continuous operation, higher capacities, heavier-weight, abrasive materials.



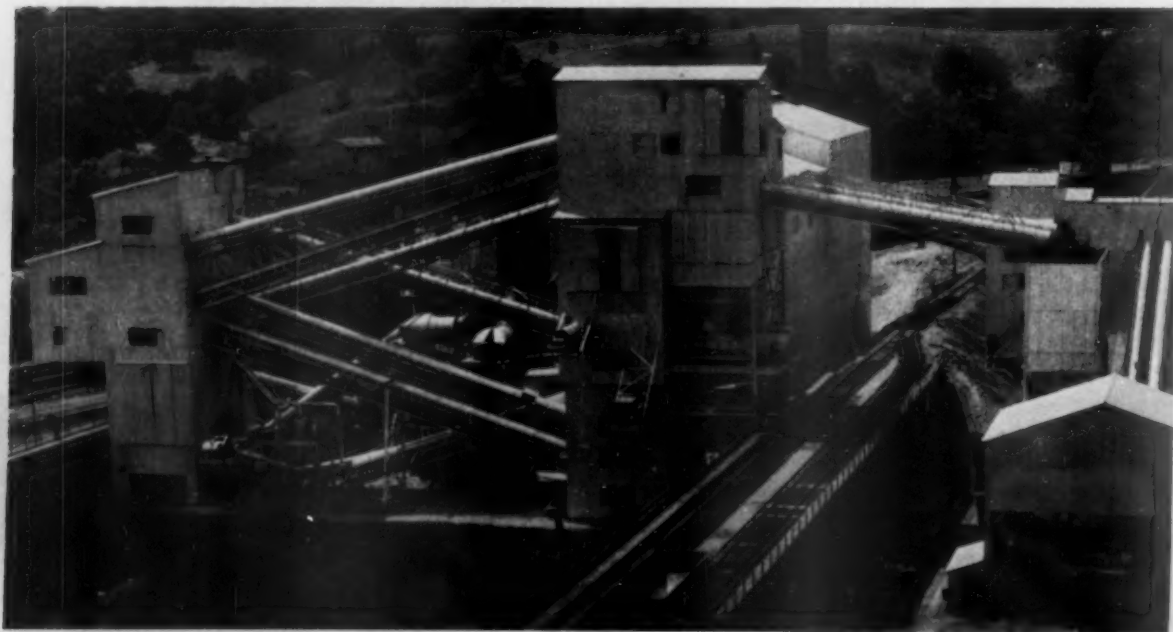
**SERIES 9000**  
For continuous service, highest capacities, heaviest and coarsest materials.

**LINK-BELT**

**BELT CONVEYOR IDLERS**

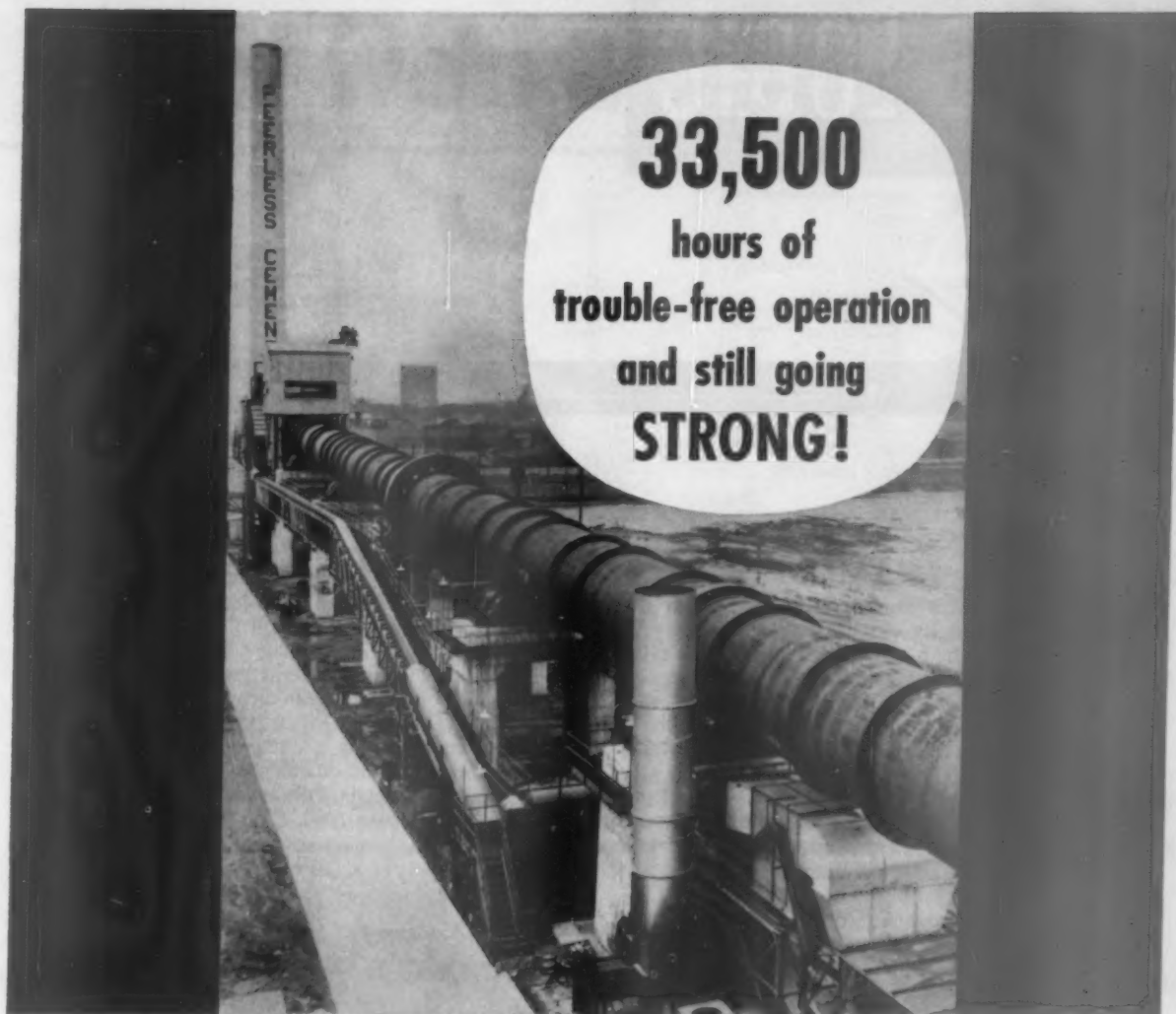
LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

15, 427



30 BELT CONVEYORS, employing five different sizes of various type idlers, keep raw materials moving steadily through this sintering plant of Armco Steel.

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**33,500**  
hours of  
trouble-free operation  
and still going  
**STRONG!**

## Typical performance of a **TRAYLOR** rotary kiln



Installed in 1956 at the Peerless Cement Company's Brennan Avenue plant, Detroit, Michigan, this 11'6" x 425' kiln has averaged 23 hours of operation a day without costly downtime. Traylor engineers, intimately acquainted with the problems and needs of the cement industry, painstakingly research and design each kiln to do its specific job. That's why Traylor kilns are noted the world over for minimum downtime and maximum years of profitable operation.

*See Chemical Engineering Catalog for further details and specifications.*

### **TRAYLOR ENGINEERING & MANUFACTURING**

DIVISION OF FULLER COMPANY

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# LUBE LOGIC 5 new ways



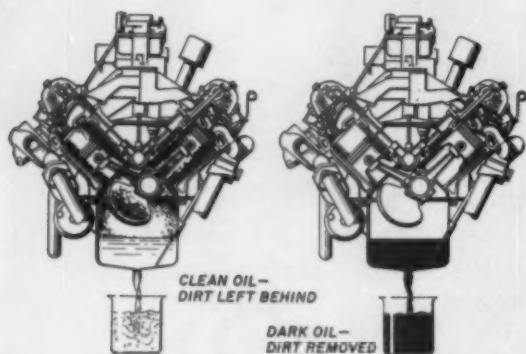
## Warm bath restores wire rope

The best way to get lubricant inside a cable, where it's really needed, is to immerse the cable or wire rope every 500 hours or so in a bath of warmed-up Texaco Crater A lubricant. It pays off by giving you far longer service life than you would get simply by applying Crater A externally.

This warm-bath treatment requires a horizontal trough to hold the lubricant. The trough should be fitted with pulleys to keep the cable completely submerged while it's passing through. A burlap collar should be rigged to wipe

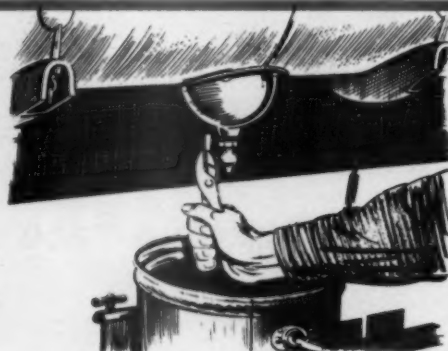
off excess lubricant as the cable leaves the box. An immersion of about a minute will allow the lubricant to work well into the strands.

This process is *not* an alternative to other lubrication. You should continue to clean the cable and apply Crater A externally every 10 to 100 hours, depending on the type of work the cable is doing. Remember also to be very sparing with lubricants on cables that wind on clutch-equipped drums, and never lubricate cables that are dragged in dirt.



## Dark engine oil... sign of a hard worker

Here's a motor-oil misconception that's still common enough to need discussion. Some folks think that the better an engine oil is, the more likely it is to come out as clean as it went in. The truth of the matter is just the other way around. A good detergent-dispersant oil holds onto dirt like an old friend. It keeps dust, soot and carbon in suspension, and carries it out of the engine when you drain the oil. Oil that looks clean when you drain it from the crankcase is a sign that these contaminants may still be inside the engine. Moral: oil that darkens in use is really doing its job.



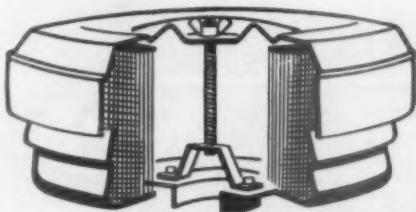
## Periodic tank drains protect diesel fuel injector

Dirt and water in diesel fuel can ruin a fuel injector in no time. Even if you keep the fuel clean during storage, there's still a chance that temperature changes will create enough condensate in the fuel tank on your rig to start rusting in the injector. Several operators have pretty well solved this problem by partially draining the fuel tank once or twice a week. Simply draw off about a gallon of fluid through the drain valve at the bottom of the fuel tank. You lose some fuel this way, but you also get the accumulated water and other contaminants clear out of the fuel system. The cost of the fuel you drain off is a small loss compared to the repair bills on the fuel injector.

# to trim downtime

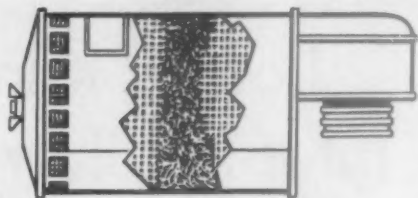
## Key points on air filter maintenance

In a day's operation a typical engine inhales several thousand cubic feet of air, and on a construction project all that air is probably loaded with abrasive dirt and dust. Good air-filter maintenance is the only way to make sure your engine gets the air and *not* the dirt. Here are some maintenance tips that will keep your air filter working better through thick and thin.

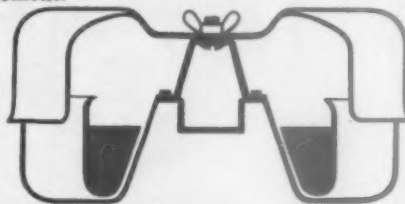


**Dry type air cleaners** (the ones with the fluted paper element) should simply be shaken or tapped lightly to remove dirt, and reinstalled. Never clean dry-type elements with kerosine or diesel fuel.

Additional precautions: empty centrifugal pre-cleaners when the glass container is half full; don't remove the oil cup when the engine is running.



If your filter is the wire gauze type, and you want to re-use the element, wash the gauze in kerosine or diesel fuel, shake it dry (*don't* blow it with compressed air) and re-oil it with SAE 40 or SAE 50 oil to coat the element.



**Oil-bath type air filters** won't function properly if there's more than a half inch of sediment at the bottom of the oil reservoir. Check the sediment level by sticking a screw-driver down into the oil, and if you're anywhere near the half-inch level the bowl should be cleaned out and refilled. Also, inspect the filter every 5 to 50 hours to make sure the oil itself is at the right level. Every 500 hours the whole cleaner should be dismantled and cleaned, and refilled with new engine oil of the same grade used in the crankcase.

## New Texaco movie can help boost your profits



This factual, down-to-earth presentation shows you how 1% of your total budget (the amount usually spent on lubricants) can minimize a major cause of equipment downtime.

**SEE:** How the biggest engineering job ever undertaken was 90% lubricated with only four different products.

**SEE:** How one contractor lubricated 21 different types of equipment with only seven products.

**SEE:** "When the Wheels Stop, Your Profits Go" — Texaco's newest sound and color movie.

**FOR AN EARLY SHOWING** contact your Texaco Contractor Representative *now*.

## TEXACO LUBRICATION ENGINEERS

Every month or so we'll bring you a batch of "sleepers"—little angles, so easy to overlook, where big savings in time and money can be made. But month in, month out, your local Texaco Man is your best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control." Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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# TEXACO

Throughout the United States

Canada • Latin America • West Africa

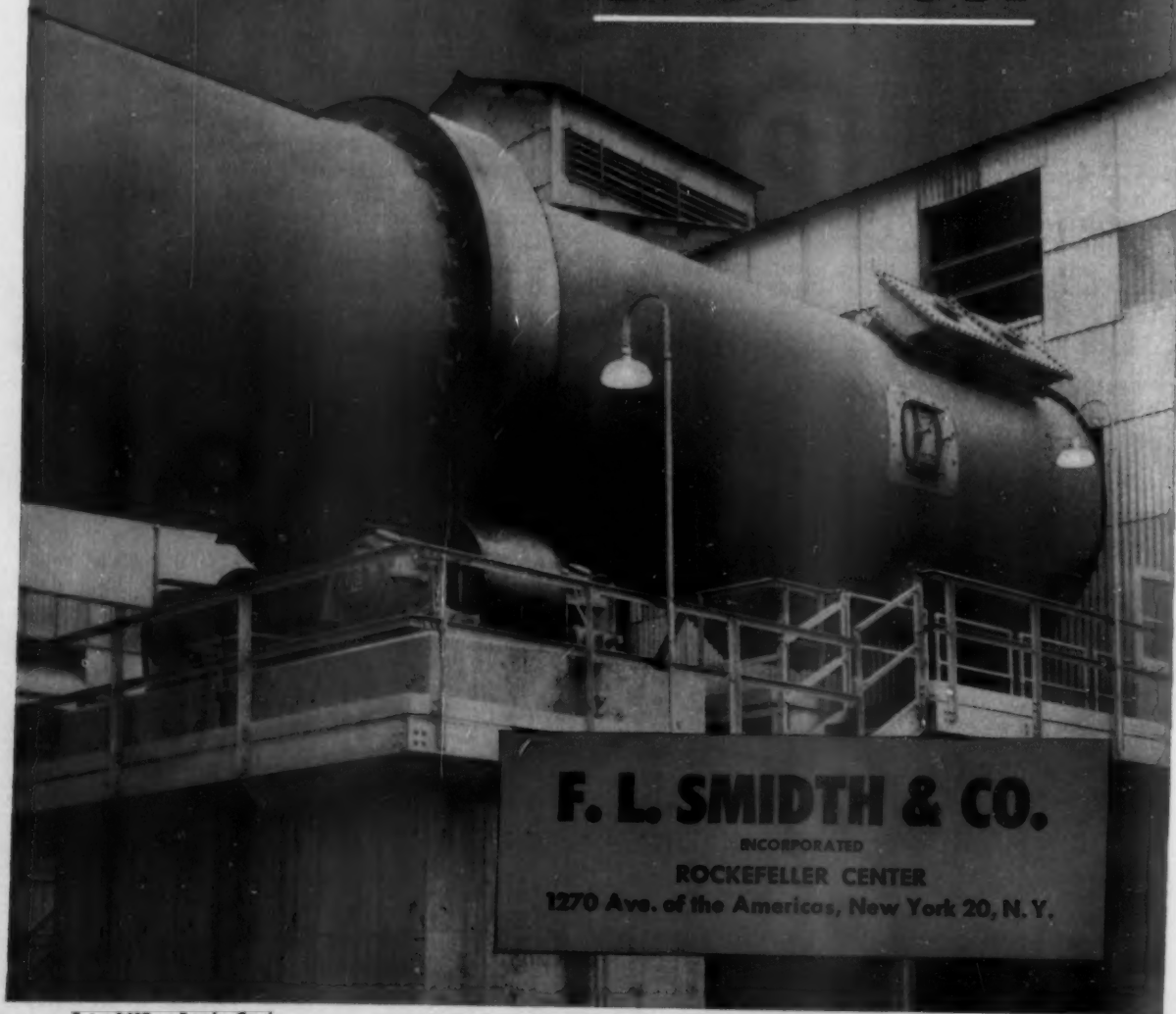


# SMIDTH



Rotary Kilns With  
Integral Slurry Preheater...

**Reduce Dust..**  
**Save Fuel**



**F. L. SMIDTH & CO.**

INCORPORATED

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# WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

**People talk about the earth's mantle, but no one really knows what it is. For this reason, test drillings will be made off Guadalupe, an island near the west coast of Mexico. The location is known for above-average heat flow from the earth's core, and is situated at the north end of the Easter Island rise, a hump-like ridge on the Pacific Ocean floor. A \$735,750 contract was awarded the Global Marine Exploration Co. by the National Academy of Sciences and the National Science Foundation to commence drilling. Plans are for a drill speed, using the firm's Cuss I rig, of 20 to 30 turns a min., with a hollow diamond-encrusted bit. Information gathered is expected to provide data on the first half of the earth's evolution which has never been studied. The Cambrian period, dated 500,000 yr. ago, shows that life had advanced to half its present stage.**

**Ohio's mineral producers may soon have recourse to an underground map currently being developed by a team of graduate students headed by Dr. Howard Pincus, chairman, Ohio State University geology department, Columbus. Their technique, which may provide the most accurate data yet on the state's underground rock structure, consists of plunging an explosive 15 to 30 ft. into the subterranean strata. Geophones then pick up vibrations reflected from the shots and transform them into variable electric impulses which are recorded by a oscillograph on a revolving drum. By measuring time intervals between shot and echoes, maps and profiles of subsurface structures can be drawn.**

**The "glass house" may become a reality, if Soviet scientists go further in their development of glass as a structural material. Researchers at Moscow's D. I. Mendeleev Institute of Chemical Technology claim to have increased the bending strength of a 3-mm. thick glass sheet up to 11 times. First they softened the glass in a 200-deg. C. furnace; then immersed it quickly in a heated organosilicon liquid bath. The bath was cooled in 20-deg. steps, hardening the glass, which was finished by drying at 200 deg. C. The unusual strength is attributed to formation of a silicon-oxygen polymer on the surface.**

**A rich load of anthracite has been discovered in Antarctica by geologists from U. S. Geological Survey, who returned to the States in January with 300 lb. of the rock from the 12 seams located. Two of these seams are 7 to 8 ft. thick, while the thickness of the others is 1 to 2 ft.—good size even by comparison with Pennsylvania coal deposits. Though the material is of fuel quality, unlike other Antarctic coal finds, a difficulty is presented to mining by the 6,000 ft. altitude. Geologists, however, can learn when the region supported plant life, and the changes in climate that have occurred at the South Pole. In turn, the information will help resolve questions about the movement of the geographic poles and the nature of continental drift.**

**Technicolored highways may ease future motor travel!** For instance, being able to follow a turquoise blue road at a complex intersection might well lessen confusion, while mustard gold curbing cautions against running off a soft shoulder. Chemists at Esso Research & Engineering Co. have been testing the new materials which will be applied as a 1-in. surface to existing pavements. The colored surfacing combines petroleum-based thermo-plastics with a rock or sand aggregate.

**Four million feet of extra-deep sand drains** are stabilizing New Jersey marshland for a 1-mile stretch of the Bergen-Passaic Expressway. First a 4-ft. layer of sand is spread over the meadow surface, and columns of sand 20 in. across and up to 130 ft. deep are punched through the muck to firm bottom. These columns, averaging 80 ft., are arranged 7 to 8 ft. apart in staggered rows. Then, an added overload of earth forces the marsh water up through the columns to the sand blanket where it runs out at the exposed edges.

**Gardeners are eagerly accepting lightweight aggregate mulch**, now that it is available in small enough packages for home use. A Louisville, Ky., woman, Mrs. Sherman Zlotolow, has started the Perma-Mulch Co., which is busily bagging shipments as order volume increases. The material, processed at 2,000 deg. in a rotary kiln, has no nutritive value, but provides a rich brown color, is not easily wind-scattered and reduces fire hazard.

**Slick highways needn't worry drivers**—at least in the vicinity of St. Joseph, Mo. Stockpiled throughout the area are limestone chips treated with calcium chloride to prevent freezing. These replace the traditional cinders as abrasives on snowy highways; the traditional cinder supply is rapidly diminishing as fewer buildings are heated with coal and more utilities are producing fly-ash instead of cinders.

**On the menu for many of the nation's chickens are granite chips** finely ground and fed with regular meal to serve as "teeth" in the fowl's gizzard. Now a \$100,000-a-year business, this product was evolved as part of the Barre Granite Association's search for ways to make use of mountains of accumulated by-products. Of the stone quarried in that area, about 85 percent has imperfections and must be discarded as grout. Then, too, the monument industry is hemmed in by the fairly static death rate, and by the growing tendency toward the use of small, flat grave markers.

**Especially designed for steel floors, roofs and beams** is a new vermiculite fireproofing. This is a mill-mixed material that can be applied directly to such members by machine operation, usually in one coat. If more are used, applications can be completed immediately because the product has a set that eliminates delays caused by curing. No primer or adhesive is necessary.

**New-type brick provides an outlet for surplus Australian sugar**, according to a report published in the official journal of the Australian Sugar Industry. Plans are being drawn up by a Sydney firm for a \$450,000 plant to produce building block for construction. The brick will hew to a European-developed formula that incorporates sugar, sand and aluminum phosphates.

GOOD YEAR

**Q:** What do Goodyear Earthmover Rims have that no others have?

**A:** MORE times FOUR

**1. MORE rims on the job:** More tons are hauled on—more earth-moving equipment rides on Goodyear rims than on any other kind. Result: You reap the benefits of the widest, soundest experience in rim design, manufacture and use.

**2. MORE kinds of rims:** Maximum rim performance stems from proper specification. Goodyear makes the *only complete line* of earthmover rims. Result: The choice that permits you to get exactly the right rim for the job.

**3. MORE rim engineering help:** Goodyear has more engineers designing *and selling* rims than any other company. And they know tires, too. Result: The help you need in choosing the right rim for top performance—longer tire life.

**4. MORE rim "firsts":** The first *true* earthmover rim, the first 5° rim, the first tubeless rim—in fact, every major earthmover rim advance was made by Goodyear. Result: The very latest in rim design and manufacture at work, for you.

What better reasons for choosing Goodyear as your rim supplier? Only these: The desire and ability to design and build any rim that may be needed for *tomorrow's* earth-moving equipment. No matter what your rim needs or plans, you'll find it pays to call on Goodyear. See your local rim distributor, or write: Goodyear, Metal Products Division, Akron 16, Ohio.



Lots of good things come from

**GOOD YEAR**

ROCK PRODUCTS, April, 1961

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13

## EDITORIAL

by GEORGE C. LINDSAY

### Better safety means dollars and sense

**Y**OU CAN INCREASE YOUR PROFIT or wipe out your operating loss by doing something constructive about the high cost of safety. Maybe you don't know it, but many rock products producers are radically slicing their profits—or increasing losses—because their properties are not operated safely.

Pretty strong words, you say. But estimates show they're true.

Each operator in the rock products industry is losing an average of about 10½¢ per man-hour of employment through safety costs alone. You readily can figure your own losses on this average basis. But industry-wide, data show that you're spending for safety an amount equal to a calculated profit on minerals you produce during one working day out of six.

What an opportunity to solve the present profit problem!

The above estimated data are based on an excellent report made available by the National Crushed Stone Association. A survey of its membership on accident costs revealed some startling facts, which should cause some eyes to be opened quickly.

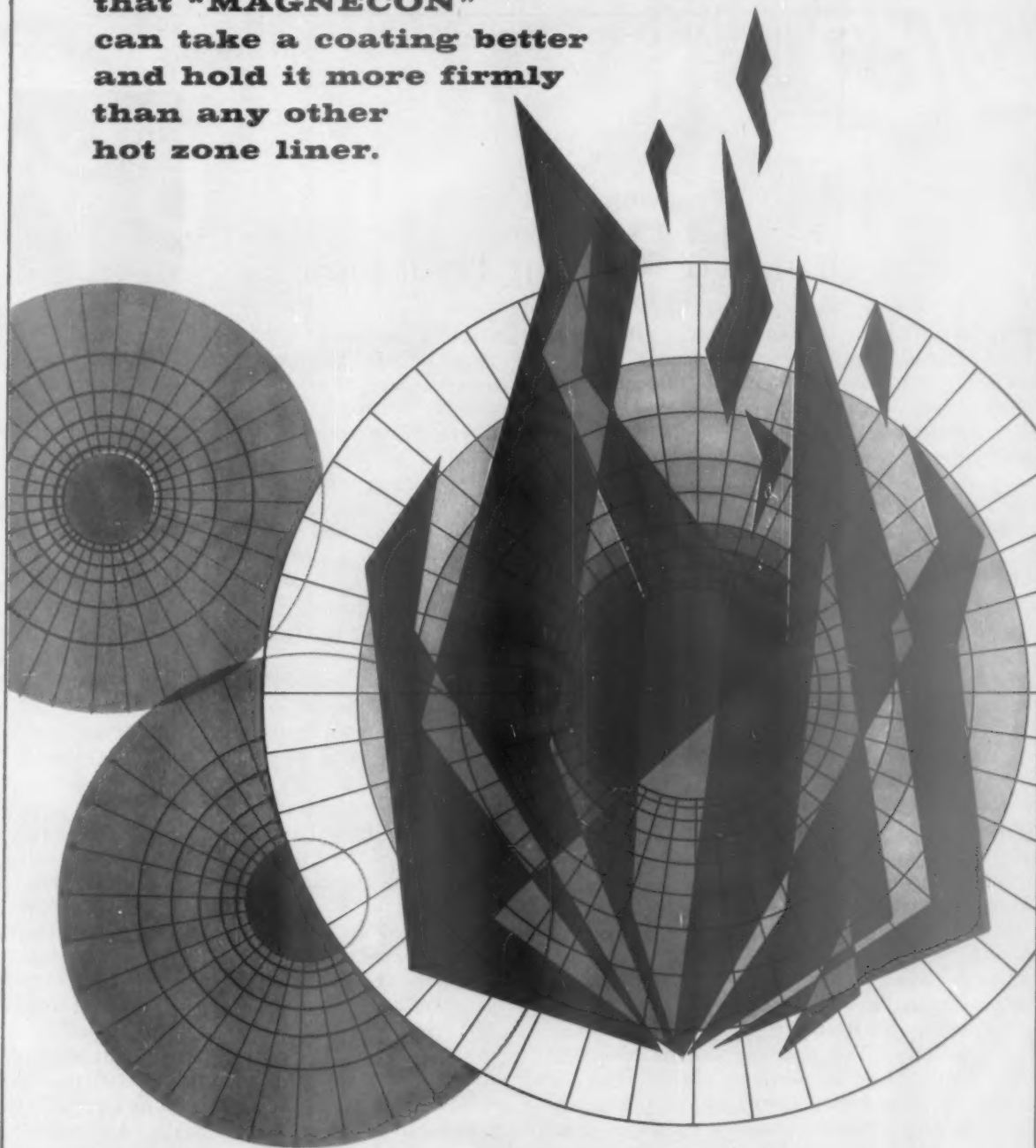
NCSA's study showed this: Total costs for personal and vehicle accidents represent the profit on \$60 million of crushed stone sales by members, figured at a 5 percent profit ratio. It made these additional points: (1) During the next 12 months, one out of every four NCSA member employees will need first aid or medical treatment for a work injury. (2) Average direct cost for each disabling work injury is more than \$800.

Obviously, the report noted that survey results "... show there is an urgent need for greater interest and support of accident prevention on the part of management."

Now, let's extend NCSA's figures to all rock products industries. The result is more than staggering—it's downright prohibitive. We estimate that our industries' total safety cost represents a 5 percent profit on \$550 million of minerals produced. That's about 1/6 of the estimated total value of all rock products mined and sold in 1960.

Enough said. The quicker you turn to the serious business of reducing accidents, the better chance you'll have of bettering what you say is your bad profit position.

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that "MAGNECON"  
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## ROCKY'S NOTES

by NATHAN C. ROCKWOOD



### Mechanics of Cement Hydration

THE THEORY that portland cement hydrated and set through practically instantaneous solution and precipitation never seemed plausible to us, since the materials required to be dissolved, mainly  $\text{SiO}_2$  and  $\text{CaO}$ , are nearly insoluble in water and exist in aqueous solutions only in dilute form. It is a problem beyond explanation by classical chemistry, requiring application of that newer branch of science known as Colloid Chemistry.

In dealing with colloids, we are not much concerned with atoms, ions and molecules, but with aggregations of them. These are many times the size of atoms or molecules, yet possess some of the same properties. One of these properties is to form almost permanent suspensions—"solutions"—in which the material preserves its integrity. It is not resolved into its atomic or ionic components, but remains in suspension in the fluid.

Thus, in extremely fine sand—even in microscopically divided form—is still silica and can be contained in a water medium in sufficient concentration to form a gel. Hydrated lime in the form of milk of lime, or as putty, is a similar colloid. To be sure, in both such colloidal "solutions" or suspensions, there is some small fractional percentage of the oxide, or hydroxide, in true chemical solution; nevertheless, there is chemical reaction between the silica and lime without the necessity of going through the true chemical solution stage.

A somewhat more plausible theory to account for the hydration of portland cement than the one usually found in textbooks has just been published by T. C. Powers, research counselor, Portland Cement Association Laboratories, in the January 1961 *Journal of the Research & Development Laboratories of the PCA* under the title, "Some Physical Aspects of the Hydration of Portland Cement." The author summarizes his paper as follows: "The hydration of portland cement requires a doubling of the volume of the solids in a specimen of paste. Half the reaction products are deposited inside the boundaries of the cement grains

and half outside, simultaneously. The process requires an insoluble material to remain in solution for great lengths of time. Also, the process occurs without much dilation of the specimen. These aspects of hydration present a problem of understanding not readily explainable in conventional terms of chemistry. An explanation is given, showing how the chemical processes are controlled by physical conditions peculiar to a system giving gel as reaction product."

The author's difficulty appears to be a desire to put into chemical terms a colloidal phenomenon that is not unique or confined to hydration of cement.

The author states: "It is significant that all methods of observation and measurement are in accord in showing that the reaction products are mostly colloidal at all stages of hydration, except the calcium hydroxide. For example, water vapor adsorption shows that the mean specific surface area of the hydration products is always within 10 percent of the ultimate value. Thus it is evident that setting and hardening does not involve much physical change in the hydration products. We have to deal with reactions that give substantially the same kind of product throughout the process." The lime, or calcium hydroxide, is ruled out evidently as a colloid, presumably because its crystals are readily recognized in newly set cement; but to us that does not mean necessarily that the bulk of it was not colloidal during the hydration process.

Powers describes four stages of hydration: (1) a rapid initial reaction; (2) a period of relative inactivity; (3) another period of acceleration, which is the period of set; (4) a period of continually decelerating rates, often called the period of hardening. In the first period, our author considers the fresh paste as a mass of discrete or separate particles of cement or clinker held apart by films of water. Cementation does not begin until bridges close the gap between particles with

*Please turn to page 138*

When you talk **tough**  
**construction jobs**

...you talk  
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**...that's why**

## **THE BIG JOBS GO BETTER WITH MACKS**

Whether you're building an expressway or hauling rock, digging out the bed for a skyscraper or moving a mountain . . . if it's the kind of job that means hauling heavy loads at a profit, it's the kind of job for a Mack.

Take a look around any big construction job and you'll notice this: The tougher the job, the more you'll see Macks. There are plenty of good reasons for using them. For instance, Mack makes trucks that get jobs done on time . . . not just when new, but long after even other so-called heavy-duty vehicles have outlived their usefulness. Not just when the going is good, but under all operating conditions.

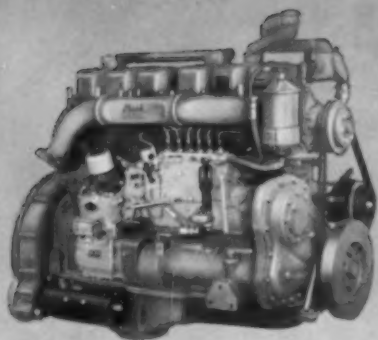
But most important, Mack truck dependability pays off in profitable, lowest-cost operation, regardless of initial price.

Mack vehicles—with rated gross capacities from 26,000 to 200,000 lbs.—are built for enduring performance. Mack-built Thermodyne® gasoline or diesel engines range from 170 hp to 225 hp and deliver maximum torque at low r.p.m. Famous Mack transmissions—five to twenty speed ranges—have ideally spaced ratios to give drivers smooth, effortless control through all speeds. Mack-engineered steering systems, providing sharp turning angles and easy handling characteristics, enable Macks to maneuver faster, squeeze in extra trips per shift. Mack's unique Balanced Bogie with PowerDivider four-wheel, rear-axle drive delivers a bias of power to the wheels with traction. These and many more features make Macks the performance and economy leaders of the industry.

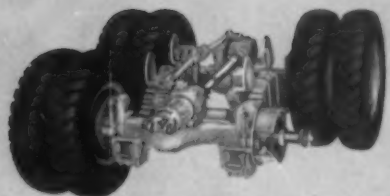


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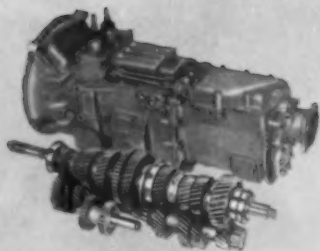
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# **MACK STANDS FOR UNDIVIDED RESPONSIBILITY**

You get Undivided Responsibility when you buy a Mack. Undivided because Mack practices Balanced Design—building far more of its vital truck components than any other truck maker in the heavy-duty field.

But what of other manufacturers? Without exception they buy many or all of their major components from outside vendors . . . engines, clutches, transmissions, front and rear axles, and drives.

Too often this means split responsibility. Who guarantees the component? Who provides the service on it? Sometimes the truck manufacturer . . . sometimes the component manufacturer.

Is this good? Mack feels it is not. When you purchase a Mack you must receive unqualified satisfaction. To insure this satisfaction, Mack insists on building most of its vital components. In this way Mack not only controls the quality of its components, but it can be sure its components will work in harmony . . . as an integrated unit.

You cannot have Balanced Design with mass produced parts—parts built to the lowest common denominator of a broad area of manufacturers. For instance, how can the same transmission fit equally well behind a gasoline engine of 400 cu. in. displacement and a diesel engine with a displacement of over 700 cu. in.? It can't—not with such a wide difference in torque output. All you can have is a lower level of standardization. And why pay a difference of a thousand dollars or more when the vital components of the highest priced competitive makes are identical in quality, construction, design and manufacture to the vital components of the lowest priced makes. Peel off the skin and they all look the same.

Not so with Mack and that's why we can assume Undivided Responsibility. We built it and we stand behind it—100%. Who else can say the same?

Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.



**Mack**

**IT'S PART OF THE LANGUAGE . . . BUILT LIKE A**

# WASHINGTON LETTER

by EDGAR POE

## **Rock products Aided by NBS Investigations**

The National Bureau of Standards began the New Year with a series of studies of marked interest to the rock products industries. At the same time, the Bureau was completing research on several projects that will be of substantial aid to the cement and asphalt industries. Primary purpose of the National Bureau of Standards is to provide a central national basis for a complete and self-consistent system of physical measurement, matched to the present-day requirements of industry, commerce and science.

The testing, calibration and certification of standards measuring apparatus is a service the Bureau renders not only for the federal, state and municipal governments, but for scientific societies, educational institutions and firms or individuals engaged in pursuits requiring the use of standards.

A study of environmental factors of temperature, humidity, heat transfer and ventilation in a family-sized underground shelter was conducted for the Office of Civilian Defense. The Bureau used simulated occupants to represent the metabolic heat release of six adults in researching the amount of heat transferred to the surrounding earth and to the ventilating air, for maximum summer and winter temperatures.

Additional investigations are going to be undertaken in an effort to develop more generalized relations between the earth characteristics, the above-ground weather conditions and the internal heat input in similar family shelters.

The Bureau has been investigating the "bond" between concrete and deformed reinforcing bars. The Bureau reports that the increase in availability of commercial grades of high-yield-strength deformed bars is stimulating interest in use of high stresses in tensile reinforcement. Because the integrity of a reinforced concrete depends upon the strength and permanence of bond between the concrete and reinforcement, research was conducted to determine the effect of the magnitude of the stress in the reinforcement on the bond of deformed bars.

"Bond strengths were determined in a series of beam and pullout specimens with deformed bars

having a nominal strength of 100,000 psi.," said the Bureau report in connection with this investigation. "The new data provided information not previously available on the bond properties of modern deformed reinforcing bars when subjected to very high tensile stresses."

## **Retirement Pension Proposals**

Several bills designed to provide a tax break for self-employed persons in establishing their own retirement programs have been introduced in Congress. Sen. Vance Hartke (D-Ind.), is sponsoring one of the measures. Similar ones have failed of passage in recent years, but there appears to be a growing demand for this type of legislation.

Under Senator Hartke's bill, permission would be granted for a tax deferral of up to \$2,500 a year or \$50,000 in a lifetime for self-employed persons (small business firms, engineers, salesmen and others) for funds put into an approved retirement program.

By terms of a bill by Sen. John J. Sparkman, Ala., any person not a member of a qualified pension, profit-sharing or stock bonus plan would be eligible to deduct up to 10 percent of his income or \$1,000 a year, whichever is less, for the amount he reserves for his retirement.

## **Kefauver Introduces Measure**

For the fourth consecutive Congress, Tennessee Senator Estes Kefauver has introduced a premerger notification bill in the Senate. He is Chairman of the Antitrust Subcommittee of the Senate Judiciary Committee headed by Sen. James O. Eastland of Mississippi. The proposal would require advance notice 60 days before transaction to federal agencies of corporation mergers if the combined assets involve more than \$10,000,000.

The tall Tennessean says his bill, among other things, would empower the Federal Trade Commission to obtain preliminary court injunctions to restrain proposed mergers before their consummation or to maintain their status quo.

**Highway  
Completion still  
At \$41 billion**

Congressional leaders of both major political parties and Secretary of Commerce Luther H. Hodges are gratified that the new estimated cost of completing the Interstate highway system did not go up over the \$41 billion estimate of three years ago. The estimate before Congress was placed there after a year's study by the Bureau of Public Roads. The federal government must put up \$37 billion of the total and the states must provide the remainder.

However, as a result of the long research, Congress now realizes that it must provide an additional \$11.6 billion if the 41,000-mile divided, multi-laned, stoplight-free highways are completed from coast to coast and on schedule in 1972.

While the new estimate of the total system costs remains the same, there is a reduction in the estimated cost of the construction of the system of about \$1 billion under those reported to Congress in January, 1958.

The inclusion in the 1961 estimate of requirements for administration, planning and research, which were not included in the 1958 estimate, offsets the indicated reduction in construction costs, and results in the over-all totals of the two estimates being identically \$41 billion.

The present estimate is based on one set of rules applied uniformly through the states. It is a sound reflection of the states' needs and provides an equitable basis for apportioning funds. Although only an estimate, it is based on the engineering judgment of the state highway departments and the Bureau of Public Roads.

There are no commitments of funds to the location, design or cost of individual projects yet to be built. Before any construction begins, each project will be further studied as necessary by the above mentioned agencies.

Additional estimates will be submitted to Congress in the years to come.

**Urban renewal  
Projects edge  
Toward 1,000**

By the end of the current fiscal year, June 30, approximately 68 renewal projects in 50 cities will be completed, another 577 projects will be underway, and planning for 310 more will be in process. These 955 projects are part of a nationwide program to restore and rebuild our decaying central cities and bring them back vigorously. They will ultimately require a total of almost \$2 billion in federal grants to pay two-thirds of the net cost. Plans for others are being blueprinted.

The Bureau of the Budget believes that if the

present trend continues, approximately the same amount will be needed for federal purchases of mortgages to finance construction of housing connected with the same projects. It is apparent that the federal aid will generate much greater private and local investment and will result in substantial increases in property values.

Former President Eisenhower, in one of his last official acts before leaving the White House, made this pertinent observation in a message to Congress: "This vital program should move forward on a basis which gives adequate assurance to local communities of continuing federal assistance, and also places proper emphasis on local participation. Accordingly, permanent authority should replace the present annual statutory limitations on federal grants, with annual amounts provided through normal appropriation process . . . For the fiscal year 1962 new obligatory authority of \$300 million is recommended."

Congress, with the approval of President Kennedy, is expected to provide about \$300 million in new authorizations for urban renewal.

**Depressed  
Area bills  
Are pending**

There are more than a score of depressed area bills pending in Congress. This project is one of five "must" proposals that President John F. Kennedy hopes to get through Congress this year. What are perhaps the principal bills were authored by Sen. Paul Douglas, (D-Ill.) and Sen. Everett M. Dirksen (R-Ill.) The Douglas proposal is similar to one that former President Eisenhower vetoed a year ago, while the Dirksen measure is like the one that Mr. Eisenhower sought to get passed.

The Douglas measure calls for \$375,000,000 in federal assistance, while the Dirksen proposal would provide \$75,000,000 in direct assistance.

There are some hot and heavy arguments involving the depressed areas measures. Proponents contend that continuing pockets of chronic unemployment are a threat to the entire economy; local depressions can spread to surrounding communities; that migration of workers is not a solution, and that existing aid programs are not helping too much.

Opponents maintain political considerations will weigh heavy in determination of the areas that would receive help, and that the federal government should not be placed in the position of helping some areas at the expense of others. Discrimination is inevitable under federal aid is another argument, and that federal aid cannot bring about a revival is still another.

When you can make  
a better

**PROFIT**

...why put up  
with this

**LOSS?**

83,000,000 TONS  
A YEAR NOW SCREENED  
ON CONVERTA-SCREEN  
VIBRATORS

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HEATING SPEEDS PRODUCTION...ENDS "BLINDING"  
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Electrically heated screens are no novelty, but peak efficiency has been reached economically only with the modern CONVERTA-SCREEN design.

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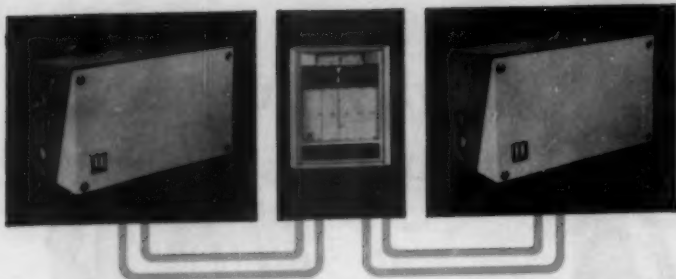
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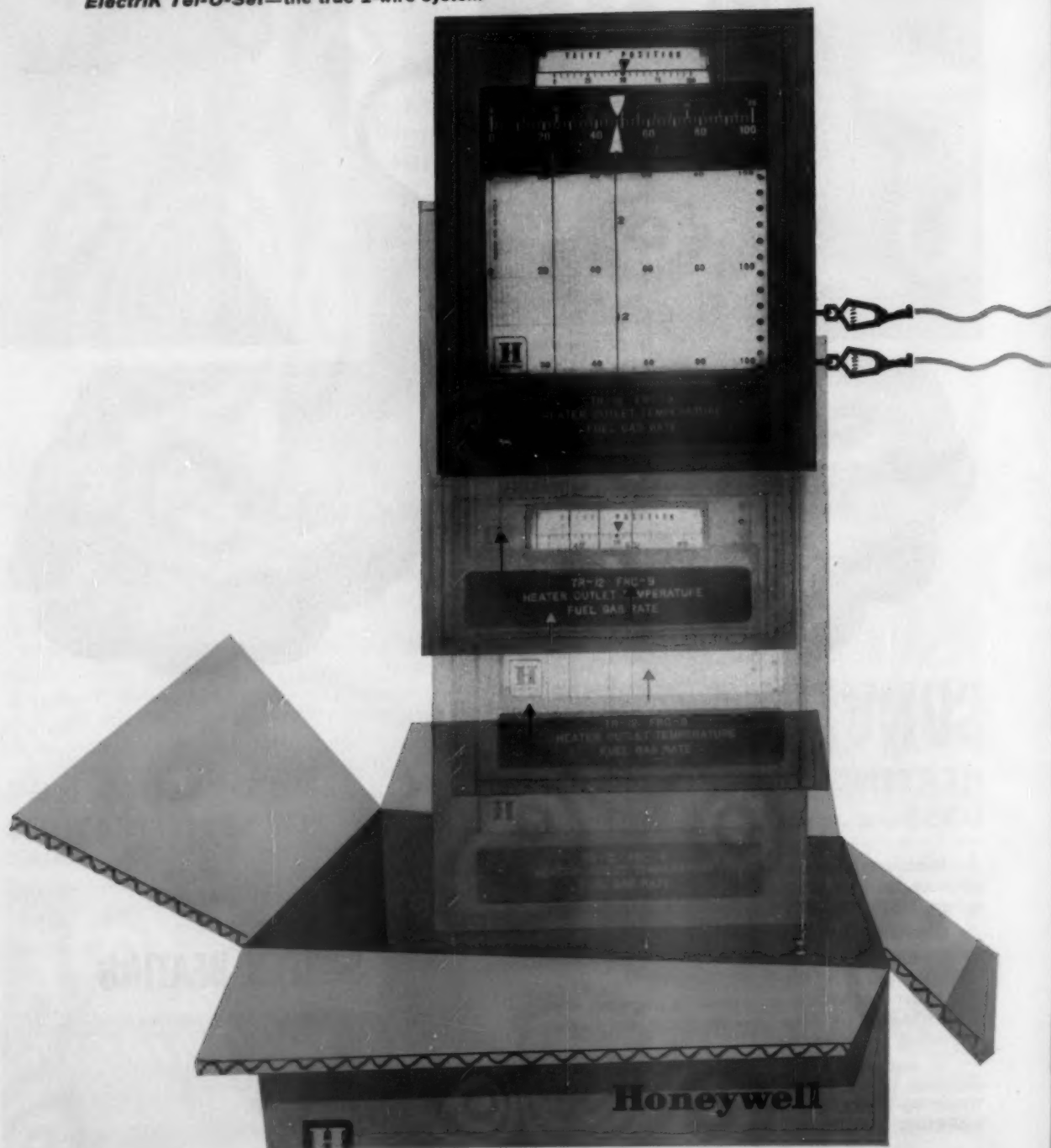
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This "Loop Snooper" adds to the extraordinary ease of installation and maintenance you'll find in the *ElectriK Tel-O-Set* System. It's a portable test instrument that can accurately check . . . from the control panel . . . any *Tel-O-Set* unit in the field, to make sure signals are being received and sent exactly as they should be. Or it can operate and check a recorder chassis, indicator chassis or controller on the bench, with local power. The "Loop Snooper" removes trial and error from installation and maintenance.



## SIMPLEST TO INSTALL, ADJUST AND MAINTAIN

The *ElectriK Tel-O-Set* System has many features that save time in getting on stream, and keep maintenance to a minimum. For example, all process connections are isolated from the inside of *Tel-O-Set* transmitter and transducer cases, so that you can mount, pipe and wire the instruments without removing their covers. Instrument chassis can be removed for servicing without breaking any external process or electrical connections. Standardized parts and extensive use of quick-connect and plug-in design cut downtime and spare parts requirements.

No external power is required at any field-mounted *Tel-O-Set* instrument; line power is connected only

at the receiver. Two-wire d-c transmission eliminates shielding and further reduces installation costs. The 4-20 milliamp signal range gives a *live* zero through the use of readily available reliable transistors.

Your nearby Honeywell field engineer can tell you how *ElectriK Tel-O-Set* advantages relate to your particular control requirements. Call him today . . . he's as near as your phone. Or write to MINNEAPOLIS-HONEYWELL, 21 Penn Street, Fall River, Massachusetts.

# Honeywell



*First in Control*  
SINCE 1885

HONEYWELL INTERNATIONAL Sales and Service offices in all principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan.

ROCK PRODUCTS, April, 1961

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# What you should know about screens

**Should your screens be horizontal?** Yes. With a screen in horizontal position, you get 12½% greater screening area and up to 30% greater screening capacity than with an inclined screen of the same size. Gradation is not only much faster, but more accurate, because in horizontal position, the full area of each screen cloth opening is utilized. This greater hourly production and more accurate grading of strict specification aggregate has been proved by 25 years' profitable service of Cedarapids Horizontal Vibrating Screens.

**Should your screen have a spreader feed box?** Yes. When correctly designed, a feed spread box absorbs the shock of dumped rock and distributes material evenly over the full width of the screen. Spreading material facilitates quick removal of fines in the first few feet of screen area, and reduces wear. A properly engineered feed spread box is standard equipment on Cedarapids Horizontal Vibrating Screens.

**Should screen action be "cushioned"?** No. The very nature of the job of separating different sizes of stone demands sharp, vigorous action of the screen decks. The required "snap" cannot be obtained if the action is air-cushioned. The lively, snappy action over the full length of Cedarapids Horizontal Screens, with no vibration transmitted to the frame, eliminates dead spots and assures faster, more effective separation without carryover.

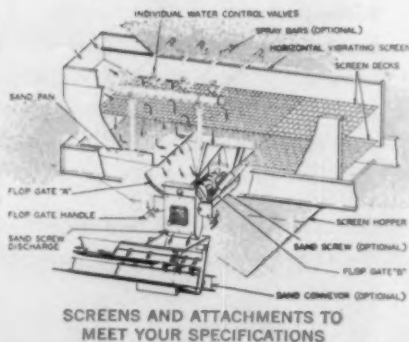
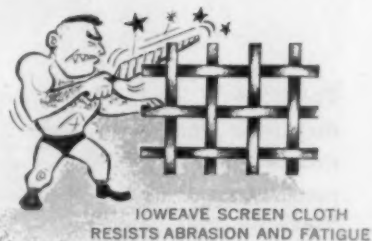
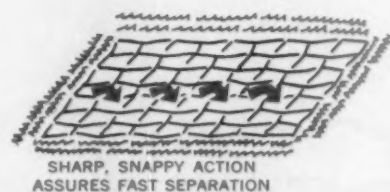
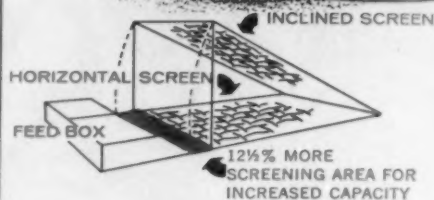
**Should screen box be stress relieved?** Yes, to insure longer life and lower maintenance. Cedarapids screen boxes and support frames for wire cloth are heat treated in a special furnace to relieve any stress that might be set up in welding.

**What about screening very abrasive material?** Let's face it! Wear and maintenance will be relatively high. But in a Canadian plant, processing rock so abrasive that it eats through ¾" mild steel plate in 35 minutes, the producer chose Cedarapids Horizontal Screens with Ioweave screen cloth, after thorough testing of many other makes. Ioweave screen cloth, made by Cedarapids from a special analysis, oil tempered wire that withstands abrasive wear, proved most economical for this tough job.

**When should you use a "special" screen?** Always! Your particular job is always "special" because there's no other like it. You need screens with the correct deck arrangements, proper cloth openings, perhaps with washing attachments . . . screens for aglime, rip rap, scalping, or portable screening units . . . whatever is exactly right to handle the special requirements of your job. In the complete Cedarapids line, there are screens, attachments, and accessories in the type and size you need.

**How can you select the best screens for your job?** Easy! First, ask your Cedarapids Dealer to help you work out your specification requirements. Then simply send them to Cedarapids for an engineered recommendation for the Cedarapids Horizontal Vibrating Screens that will meet your specifications with lowest cost per ton.

## MEET SPECIFICATIONS-



at lowest cost per ton...With

# CEDARAPIDS HORIZONTAL VIBRATING SCREENS

Cedarapids' 25-year-proved design of Horizontal Vibrating Screens brings you the profit-benefits that insure high capacities of specification-perfect products at lowest cost per ton. The horizontal position of the screen, plus its snappy live action, permits more material of the correct size to pass through each deck. Crushers are not bogged down by screen carryover. Your entire plant is production-balanced for maximum hourly tonnages.

The extra-high capacity and extremely close

gradation of Cedarapids Screens cut down the circulating load, thus reducing wear on crusher jaws, roll shells and conveyors. Lower over-all plant maintenance cuts your cost per ton still further.

Always specify Cedarapids Horizontal Vibrating Screens for your stationary installations. And to be sure of *most* efficient, *most* profitable operations, call on Cedarapids to engineer your entire plant.

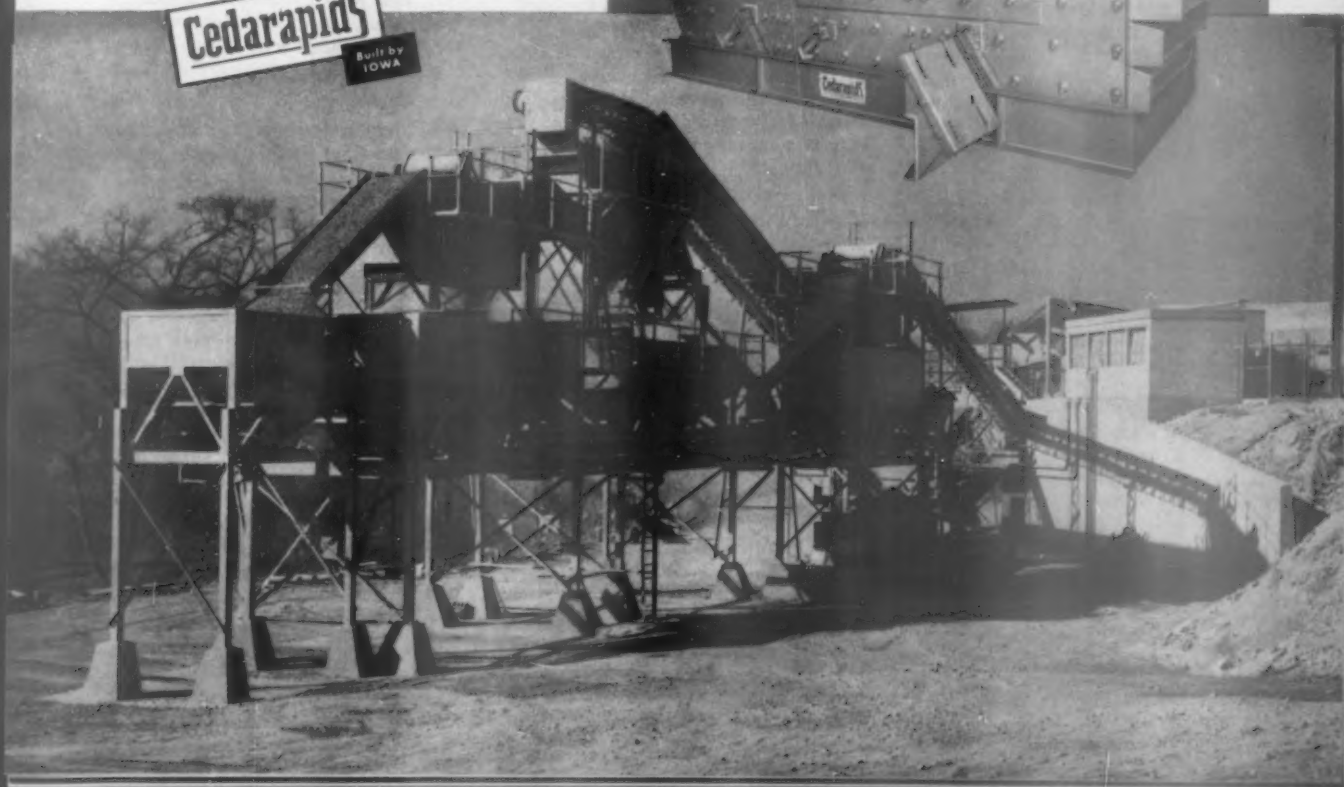
Write for information today!

**IOWA MANUFACTURING COMPANY • Cedar Rapids, Iowa**

Three Cedarapids 4' x 12' double deck Horizontal Vibrating Screens grade aggregate into specified sizes after it is broken by a Cedarapids Double Impeller Impact Breaker. This stationary installation is operating in Pennsylvania.

S-1060N

**Cedarapids**  
Built by  
IOWA



# LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS  
AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

## How would you decide?



### Can you fire an employee for fighting with his foreman after working hours?

**What Happened:** John Herbst, a union steward, was feuding with his supervisor for some time. There had been several incidents. John had been disciplined for smoking in "no smoking" areas and for drinking beer while on errands for the company. John said the boss was picking on him—since other workers smoked in the same areas and he only drank beer during his lunch hour.

One day John heard that his foreman was encouraging the employees to leave the union. A company official overheard John say that he was "going to get that ———". That night the two men happened to meet outside a supermarket. John asked his boss, "How does it feel to be a rat?" and told him to "put down your groceries and let's have it out right here and now." Hot words were tossed about, but nobody struck a blow.

The next night the foreman ran into John at a parking lot. The employee started a fist fight and got a bloody nose. When John recovered from his injuries, he returned to work. He was told that he had been discharged for fighting with his foreman. John argued that the discharge was unfair because:

1. The discharge was part of the su-

pervisor's discrimination against him for his union activities.

2. He was the one who had been hurt when the supervisor kicked him—and the company did not discipline the supervisor.

3. The company does not have the power to discipline him for activities committed after work and away from the company premises.

**Was John:**

**Right?** ☐ **Wrong?** ☐

**What Arbitrator Smith ruled:** "The established principle is that the employer does have disciplinary authority with respect to altercations engaged in by employees off premises and outside working hours. This altercation arose out of the relationship in the course of the employment of the two men and with respect to matters concerned with their employment. Even though the supervisor's assault was certainly improper, the union has no contractual or other basis for questioning management's relations with its supervisors, or for demanding that disciplinary action shall be meted out uniformly and in precisely the same manner as between members of supervision and employees represented by the union. The discharge of John Herbst is proper."

### Can an employee refuse to work on a holiday?

**What Happened:** The company was having trouble in scheduling its work for July 4th. The usual practice of asking for volunteers didn't work out—there weren't enough volunteers. Management decided to order the low seniority employees to report for work on that day.

When the supervisor asked Mike Robbins and Joe Holtz to plan to work on July 4th, both men refused the assignment. They said that their wives had made reservations which required them to leave right after work on July 3rd. The foreman warned them that

they would be disciplined if they failed to show up. Their efforts to find substitutes were without success.

Mike and Joe didn't come to work on July 4th. When they came in after the holiday, they found discipline notices on their time cards. Both men objected to the company's action. They insisted:

1. Management has no right to require work on a holiday.

2. Previous holiday work had been on a volunteer basis.

3. No disciplinary action had been taken in the past against workers who refused a holiday assignment.

4. Management knew that both employees had arrangements for the holiday weekend. Ordering them to work wasn't fair.

The company stuck to its guns. It stated:

1. The right to manage carried with it the authority to require employees to work on holidays when necessary.

2. The workers' refusal without a valid reason was insubordination. They were justly disciplined.

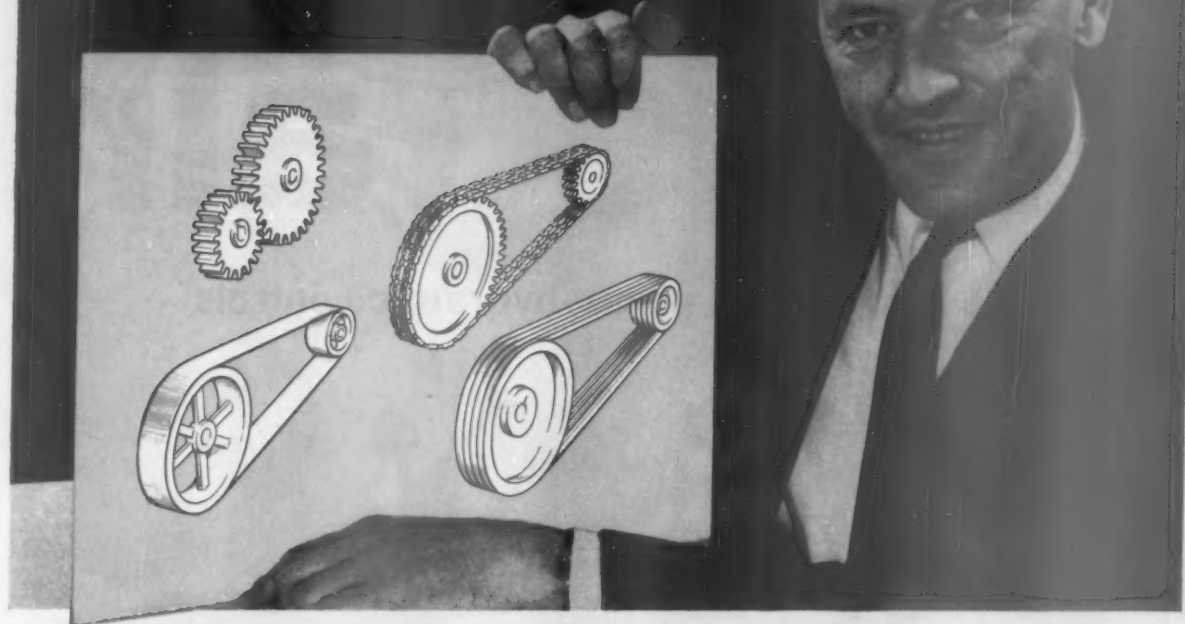
**Was management:**

**Right?** ☐ **Wrong?** ☐

**What Arbitrator King ruled:** "Nothing in the contract limits the right of the company to require holiday work. There is no clear and convincing proof of any such limitation in the past practice of the company. Management made a reasonable effort to obtain volunteers for the holiday work—it offered distinct inducements. It ordered the employees concerned here to work on the holiday only as a last resort. The selection of the least senior employees was a reasonable choice. To be excused from reporting on a holiday, when ordered to work, would need the same reasons that would be acceptable for failing to work any other scheduled workday. A serious inconvenience to vacation plans would not be sufficient. The grievance is denied. The two employees were properly and justly disciplined."

END

*Now, redesign...  
if these drives give you trouble*



## Ask your local Gates Man to show you how Super HC Drives reduce machine down-time

If you have a chain, gear, flat belt or even a conventional V-belt drive that is causing costly production down-time or high maintenance costs, your local Gates Man will be glad to help you. He will show you how these troubles can be ended by using a Gates Super HC V-Belt Drive—the first and most advanced High Capacity drive.

Because of exclusive design features, Gates Super HC V-Belts handle up to 3 times the horsepower of conventional V-belts in the same space—or they can often handle the required horsepower in about half the space. Fewer belts are needed, and sheaves can be smaller and lighter weight.

As a result, bearing loads are less, increasing bearing life, reducing maintenance costs.

Gates Super HC Drive is quiet, smooth-running and entirely dependable—multiple belts assure you of continuous operation, ending costly production losses. It is a highly resilient drive that protects your machine from vibration and damaging shock loads, increasing machine life and lowering maintenance costs—savings that often amount to many times the cost of the drive.

*The Gates Man located near you is a drive design expert. Ask your nearby Gates Distributor for his help when you have a drive problem.*

The Gates Rubber Company, Denver, Colorado

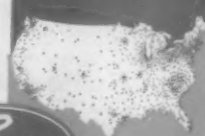
# ***Gates Super HC V-Belt Drives***



*Building the  
future on  
50 years of  
progress*

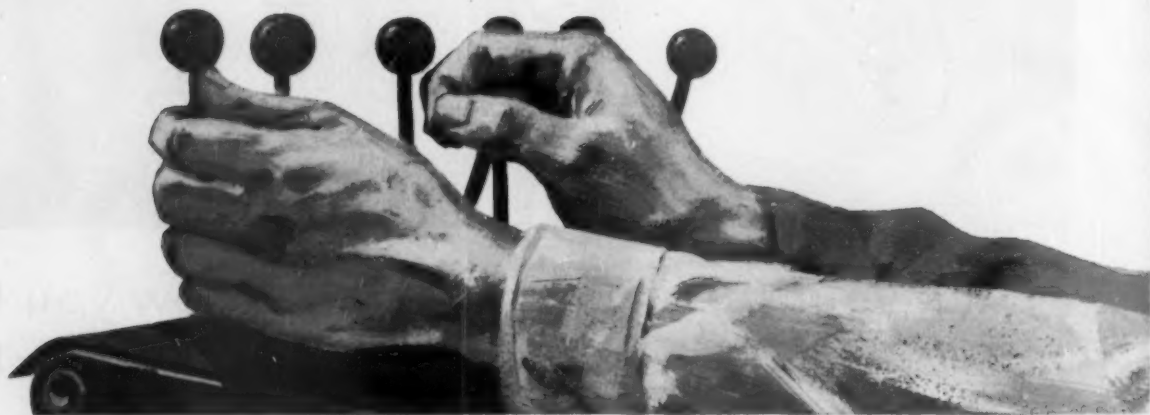


There is a Gates Man  
— a drive expert —  
located near you:



# no sweat, no strain

with Speed-o-Matic power-hydraulic controls



## Pinpoint control . . .

**SHORT-THROW POWER CONTROLS**  
insure safe, accurate shovel-crane operation,  
beat fatigue, boost production

Speed-o-Matic is not an air, partial booster or mechanical system. Basically, it's the same precise power-hydraulic control system you find on aircraft, machine tools, farm equipment—your own family car if it has power-brakes or steering.

On a Link-Belt Speeder the true power-hydraulic controls govern all fundamental shovel-crane opera-

tions — booming, swing and travel, load lowering/hoist and steer. To slip the machine into action you merely nudge short-throw control levers. Response is instant and smooth; no delay for pressure build-up . . . no jump . . . no snap.

Ask any Speed-o-Matic operator. He'll tell you it's the most fatigue-free, productive system he's ever worked . . . and the safest too! Speed-o-Matic lets him spot loads with pinpoint accuracy, lets him maneuver with wrist-action simplicity, lets him concentrate on the job, not the machine.

Speed-o-Matic power-hydraulic  
controls are standard on the  
entire Link-Belt Speeder line





## Easy maintenance...

**HYDRAULIC SYSTEM PRACTICALLY MAINTENANCE-FREE** — Speed-o-Matic clutches automatically compensate for heat and normal lining wear

The Speed-o-Matic hydraulic system requires no priming or bleeding — only routine seasonal oil changes. There are no bushings, pins, links, clutch toggles. The actuating mechanism is oil-immersed. A micronic-type, replaceable filter keeps oil clean.

Interchangeable Speed-o-Matic clutches require little operator attention. Hydraulic-actuated cylinder

pistons compensate automatically for normal lining wear, heat expansion or weather changes. There are no nuisance adjustments.

Twenty-five years of hydraulic manufacturing experience backs Speed-o-Matic; Link-Belt Speeder introduced the system in 1936. It is a modern product of the finest hydraulic shop in the shovel-crane industry. And all components (except pump) are made by Link-Belt Speeder. Get the complete Speed-o-Matic story from your distributor. Or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

107-61N

## LINK-BELT SPEEDER



21 crawlers



6 truck cranes



4 self-propelled

**It's time to compare... with Link-Belt Speeder**

ROCK PRODUCTS, April, 1961

Enter 1419 on Reader Card

## PEOPLE IN THE NEWS



L. J. Mueller



W. D. Garvin

### Mueller succeeds Garvin at Standard Lime & Cement Co.

L. J. MUELLER (left) has been named vice president of operations, Standard Lime and Cement Co., Baltimore, Md., succeeding W. D. Garvin (right) who has retired after 35 years of service.

Mr. Mueller, a graduate of the University of Alabama School of Mines and former engineer and geologist with the U. S. Engineers and the U. S. Geological Survey, joined the company in 1936. He was appointed assistant vice president of operations in 1959. He will continue as vice presi-

dent of operations of Dragon Cement Co. Well known in the lime and cement industries, Mr. Mueller at present is serving on the General Technical Committee of the Portland Cement Association.

Mr. Garvin joined Standard Lime and Cement in 1925, serving as chemist, technician and salesman. During his early years with the company he was instrumental in the development of many of the manufacturing and testing techniques still being used in the lime industry.

### Bruce Campbell, Sr., retires from H. T. Campbell Sons' Corp.

BRUCE S. CAMPBELL, SR., has retired from active day-by-day management of Harry T. Campbell Sons' Corp., Towson, Md., after 53 years of service, but retains the position of chairman of the board. H. Guy Campbell continues as vice chairman of the board.

Bruce S. Campbell, Jr., president, assumes the title of vice president in order to concentrate his efforts on the company's extensive quarrying operations, while R. McLean Campbell succeeds him as president of the com-

pany. McLean, a graduate of Princeton University, joined the company in 1953 and has served as secretary since 1958.

Robert F. Porter, vice president of material sales, has been appointed executive vice president, and S. James Campbell, treasurer, has been named vice president and secretary-treasurer.

Officers of the company who will continue in their present positions are: Harry G. Campbell, Jr., vice president; Albert S. Cummins, vice president—Sakrete Division; Robert B.

Hamill, controller; Frederick W. Brandt, assistant secretary and assistant treasurer, and William B. Campbell, assistant secretary and assistant treasurer.

### National Gypsum names Huffman plant manager



JAMES M. HUFFMAN has been appointed plant manager of the Kimballton, Va., plant of National Gypsum Co., Buffalo, N.Y. He succeeds Monroe Rule who died December 22, 1960. A native of Giles County, Va., Mr. Huffman attended Bluefield, W. Va. College and the Virginia Polytechnic Institute. He joined National Gypsum in 1947 and has served as mine foreman, kiln foreman, mine superintendent and production superintendent since that time.

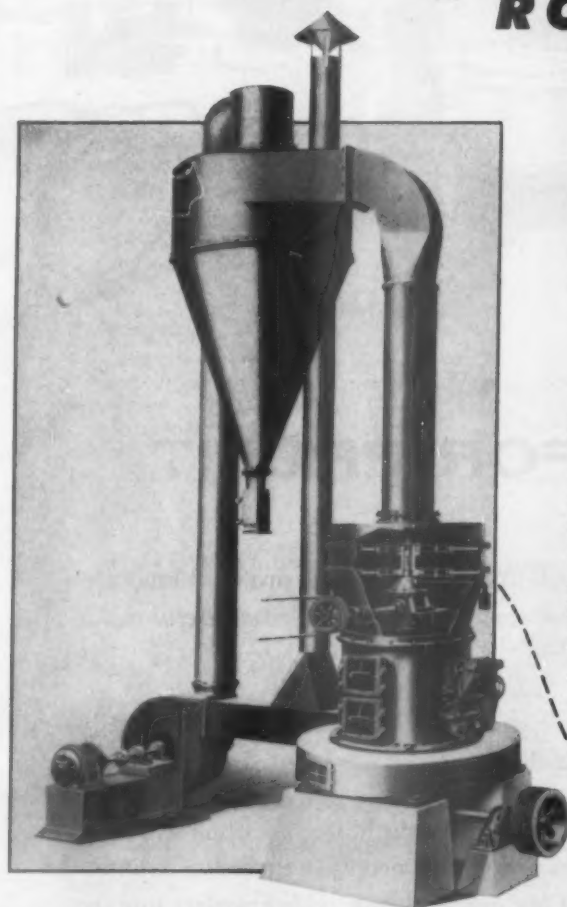
### Western Gypsum elects director

NIGEL W. PUTTOCK has been appointed a director of Western Gypsum Products Ltd., Winnipeg, Canada, and its two subsidiary companies, Westroc Industries, Ltd., Vancouver, and Wesco Paints Ltd., Montreal. Mr. Puttock joined the company in 1959.

(Continued on page 39)

# roll up new production... and profit...records

with *Raymond*  
**ROLLER MILLS**



RAYMOND MULTI-PURPOSE ROLLER MILL  
WITH DOUBLE WHIZZER AIR SEPARATOR

**Top performing RAYMOND Multi-Purpose ROLLER MILLS with WHIZZER AIR SEPARATION lead the field in fine grinding in the CHEMICAL and PROCESS INDUSTRIES.**

This Mill combines the Raymond High Side Roller Mill and the double Whizzer Separator to afford great versatility and economy in the handling of many fine grinding problems.

Its wide scope of application covers the preparation of powdered materials . . . from simple fillers to fancy chemicals. Typical products pulverized include . . .

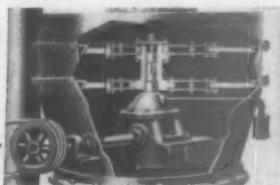
**PIGMENTS • FULLERS EARTH • INSECTICIDES • IRON OXIDES • TALC • BARYTES • KAOLIN AND CLAYS • SULPHUR • CARBON MIXTURES • STARCH • LIMESTONE • BAUXITE • CALCIUM SILICATE • MINERAL FILLERS • PHOSPHATE ROCK • GYPSUM.**

A single, easy adjustment of the Whizzer controls the fineness range from 20-mesh grades to products essentially all minus 325-mesh.

Mill capacities reach 40 tons per hour and more with a Super Roller Mill. Flash Drying Accessories may be installed when moisture removal is required.

All aspects of Fine Grinding are combined in a clean, dust-free, automatic system that is economical in operation and maintenance. Installations are flexible and readily adaptable to any plant layout.

For detailed information send for the  
Raymond Roller Mill Catalog Number 79 R



Mills are available with Single or Double Whizzer Separators. Whizzers have set of radial blades attached to a disk that revolves on a vertical shaft in separating chamber. Variable speed drive insures finger-tip control of fineness.

## COMBUSTION ENGINEERING, INC.

Combustion Engineering-  
Superheater Ltd.  
Montreal, Quebec, Canada

*Raymond Division*

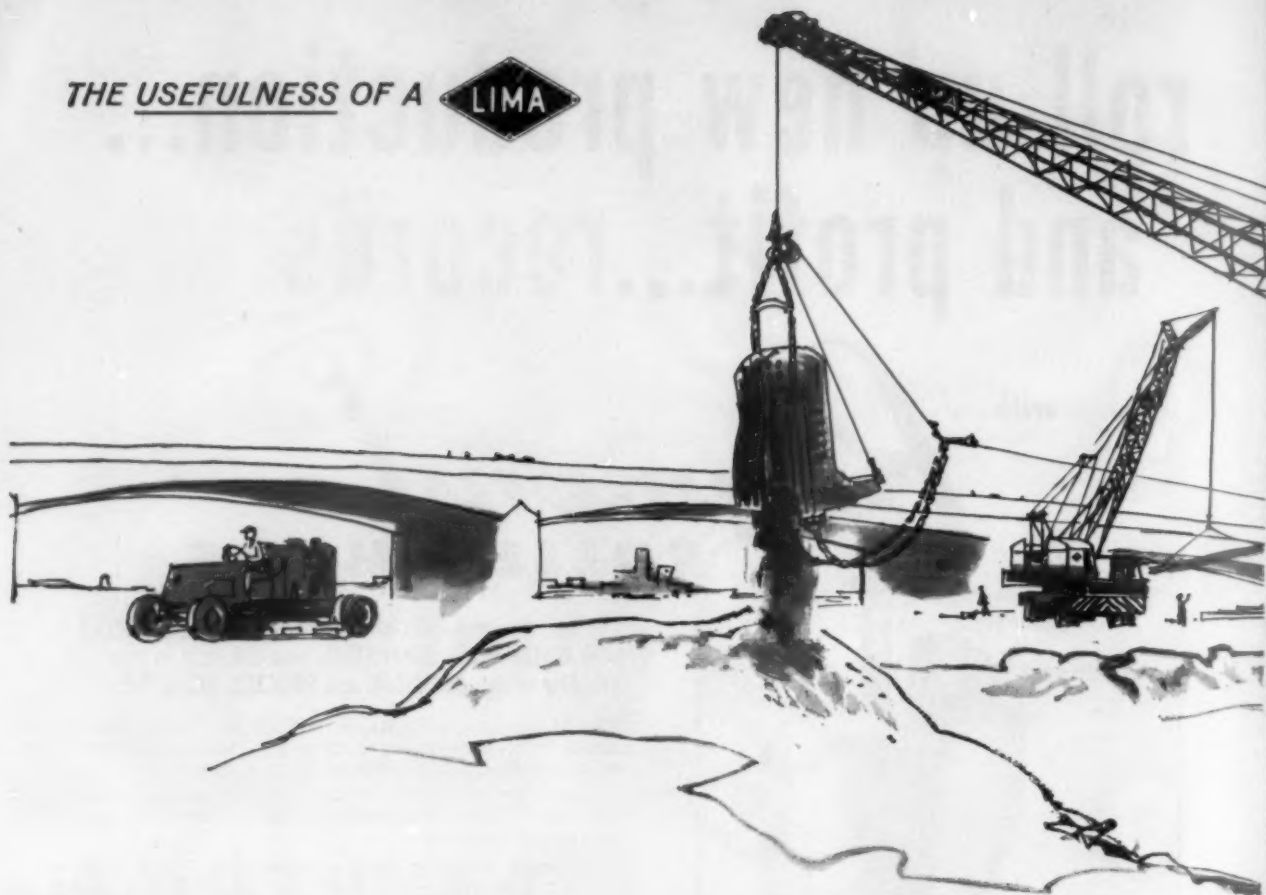
437 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

Sales Offices  
in all  
Principal Cities

Enter 1411 on Reader Card

ROCK PRODUCTS, April, 1961

THE USEFULNESS OF A



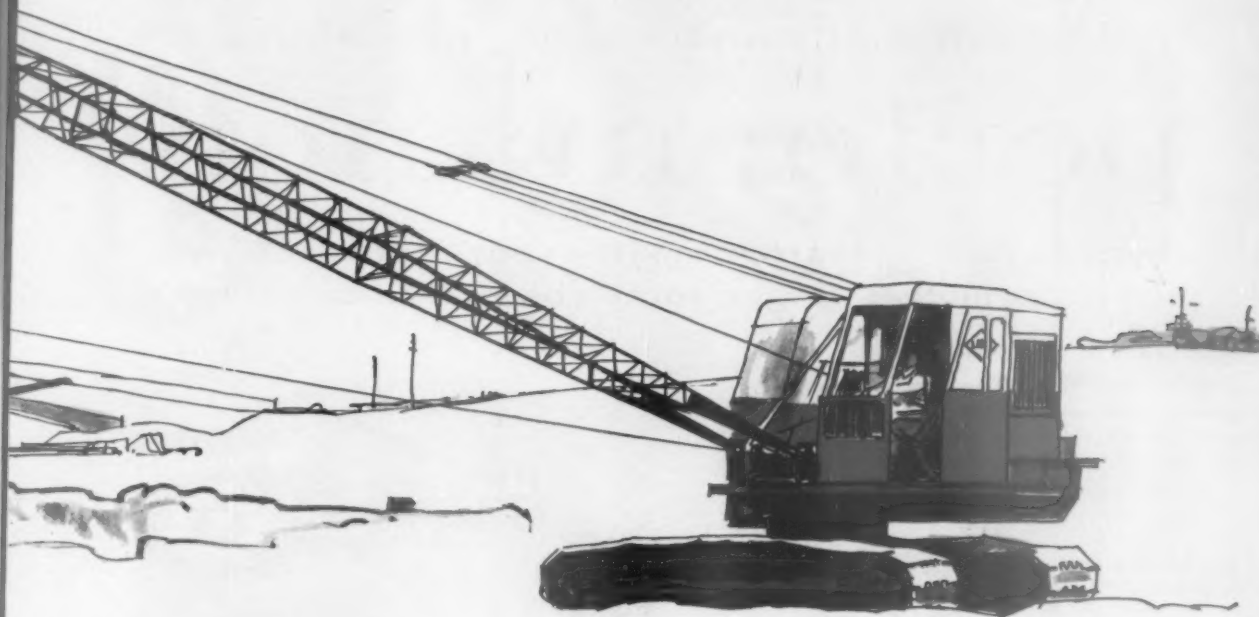
## HOW TO CAST FOR PROFIT

Long, precision casts with Lima draglines help pull in extra excavating profits. Limas are noted for fast, smooth digging cycles—partly the reason they are *the most useful make machines you can buy!*

But there is more to outstanding performance than meets the eye. It is backed up by Lima's traditional quality in manufacturing and design.

Big, wide drums are mounted on antifriction bearings for smooth, free spooling when the bucket is cast. Balanced machinery weight does away with need for excessive counter-weight so that you can work with *long booms at low angles*. Long, wide crawlers hug the ground for extra stability on soft footings; antifriction bearings protect all wearing points. On Limas all gears, smaller parts and shafts that are subjected to extra wear are flame or induction-hardened for longer life.

Maintenance is low because Limas are better built. For the same reason Limas can be counted on to stay on the job and earn more profit for you. Ask us to prove it to you.



#### CAPACITIES

DRAGLINES—Variable

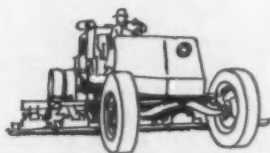
TRUCK CRANES—20 to 80 tons, boom-jib combinations to 250 ft.

WAGON CRANES—20 to 75 tons

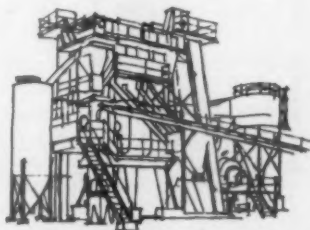
CRAWLER CRANES—15 to 140 tons

CRAWLER MOUNTED SHOVELS— $\frac{3}{4}$  to 8 cu. yd.

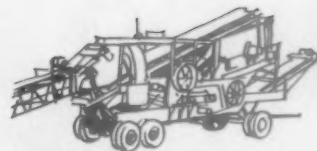
CRAWLER MOUNTED PULLSHOVELS—to 4 $\frac{1}{2}$  cu. yd.



**LIMA MODEL D ROADPACKER**—Six vibrating shoes consolidate fast, deep for profitable single-course construction; available in 12-shoe Super model.



**LIMA MADSEN ASPHALT PLANTS**—available in models with batching capacities from 1000 to 10,000 lb.



**LIMA AUSTIN-WESTERN** portable and stationary crushing, screening and washing equipment; including jaw crushers, feeders, screens, elevators, conveyors, bins.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

**LIMA** Construction Equipment Division • Lima, Ohio  
**BALDWIN • LIMA • HAMILTON**



ROCK PRODUCTS, April, 1961

Enter 1428 on Reader Card

# Reports continue to show H-120 setting unmatched standards of production and performance

Owners and operators testify that it outperforms and outproduces larger, more costly tractor-shovels

**Superintendent Says:** "This machine has plenty of power to get maximum loads under all working conditions. The roll-back bucket action heaps and keeps the full load during delivery cycle. The material just seems to flow into the bucket during digging with an absolute minimum effort and no strain whatsoever. The high lift and long reach enables the operator to distribute the load on the truck, enabling the trucker to haul a maximum balanced load to state road specifications."

**Operator Says:** "The H-120 has unmatched pry-out power and more digging power than any other large rubber-tired loader. The machine never runs hot no matter how hard the digging gets. It has good load-carrying balance."

**Plant Manager Says:** "We needed a versatile machine for large truck and rail car loading and the H-120 with its long reach was the answer to our needs. This unit gives us a 15-foot reach with ease and has very efficient loading speeds. It never uses full power and it fills the bucket with minimum effort. It has replaced two other loading machines."

**Owner Says:** "The additional capacity of the H-120 and its faster load-out speeds has cut our basic hauling equipment needs in half on the pit-to-plant short haul operation. The high reach of the bucket gives evenly distributed loads which makes it easier on the hauling equipment."

**Superintendent Says:** "The better balance, speed and maneuverability of the H-120 makes it a better buy than larger competitive models tested on the job."



PAYLOADER is convertible to this D-120 PAYDOZER

**Operator Says:** "I haven't had to work very hard since putting the H-120 loader on the job. Even with a 23 truck fleet on a short haul, I am waiting for trucks. One day we moved 5,800 tons and could better that if we had a few more trucks. This unit is the fastest working big loader we have ever tried. It's a dream to operate with power controls, fast responses and clear, open vision of the bucket and of the area all around the loader at all times."

You must see the H-120 in action to appreciate its outstanding performance. With its 300 h.p., 12,000-lb. Operating Capacity, higher dumping clearance (10' 10"), longer reach (3' 6" at max. dumping height) and other superior features, it is the best buy in big tractor-shovels. Get full details from your Hough Distributor today — also find out how economically you can convert this tractor-shovel to the D-120 PAYDOZER.

**THE FRANK G. HOUGH CO.**  
705 Sunnyside Ave., Libertyville, Ill.

- ☐ Send data on H-120 PAYLOADER & D-120 PAYDOZER.  
☐ Send data on smaller PAYLOADER models.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

4-B-3



**THE FRANK G. HOUGH CO.**  
LIBERTYVILLE, ILLINOIS

SUBSIDIARY - INTERNATIONAL HARVESTER COMPANY

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER, PAYLOMATIC and PAY are registered trademark names of The Frank G. Hough Co.



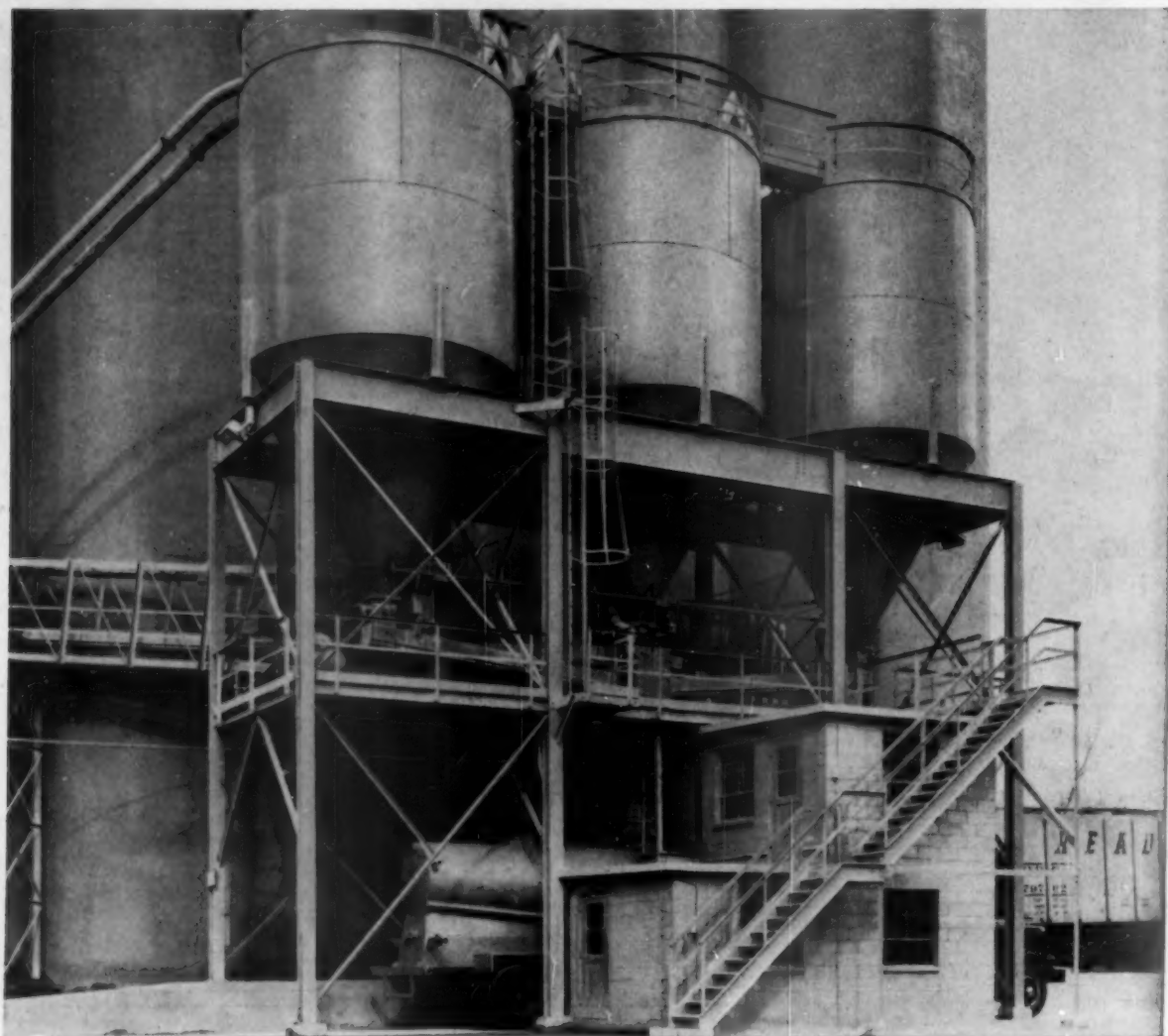
®

# HOUGH

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**PAYLOADER®**



## Why 9 Out of 10 New Bulk Loading Stations Use Airslide Conveyors

Fuller Airslide® Fluidizing Conveyors are the overwhelming choice for bulk truck-loading because dry pulverized materials, such as cement and barite, are bulk-loaded cleanly and efficiently in less than 5 minutes per truckload. One man can control the entire loading operation. Problem of dust is minimized since dust can be easily vented to dust collectors.

### RIDES ON AIR

Material is conveyed on a blanket of air in the upper chamber of the two-chamber conveyor. Low pressure air is blown through the lower chamber, from which it

*"See Chemical Engineering Catalog for details and specifications."*

passes upward through a layer of porous fabric. There is no need for moving parts, no noise, no lubrication. And fluid delivery by air means ease of control and fast shut-off when necessary.

### LOW HP

Airslide Conveyor installations are characterized by their low horsepower consumption.

Airslide Conveyors are efficient and economical in operation too. Fuller engineers will gladly tell you more about how they can apply to *your* bulk loading needs. Write us at the address below.

2554  
G-238



**FULLER COMPANY**  
102 Bridge St., Catasauqua, Pa.  
Subsidiary of General American Transportation Corporation  
Offices in Principal Cities Throughout the World



Enter 1499 on Reader Card

## PEOPLE IN THE NEWS

(Continued from page 32)



### Luther Miller retires from New York Trap Rock Corp.

LUTHER F. MILLER has retired as electrical superintendent of New York Trap Rock Corp., West Nyack, N.Y., after 34 years of service. At three farewell dinners held in his honor, Mr. Miller was presented with an engraved silver tray, silver bowl, and an engraved plaque.

Mr. Miller pioneered millisecond delay blasting with development and construction of a mechanical electric switch. The new blasting switch was presented at a meeting of the National Crushed Stone Association and was quickly accepted by the industry. A patent was obtained and engineers and quarry operators from nearly every country in the world communicated with Mr. Miller for details.

Mr. and Mrs. Miller have purchased a home in Pompano Beach, Fla., at 2121 N. E. 34th Court, Lighthouse Point, where he will continue his hobbies of growing roses, photography and making concrete figurines.

### Keystone sales appointments

JOHN BILLIE has been appointed general sales manager of the Keystone Portland Cement Co., New York, N.Y. Edward H. Ward has been named sales manager, and Robert G. Springer, assistant sales manager.

### John S. Lane & Son names new president

F. CURTIS LANE has been elected president of John S. Lane & Son, Inc., Meriden, Conn. Formerly vice president in charge of quarries, Mr. Lane succeeds Arthur F. Eggleston.

(Continued on page 42)

# This Bond Is an Investment in You

**Guarantee Bond  
ON USED EQUIPMENT**

**Know All Men by these Presents,**

that \_\_\_\_\_ (hereinafter called Seller),  
of \_\_\_\_\_  
is hold and lawfully bound unto \_\_\_\_\_  
of \_\_\_\_\_ (hereinafter called Buyer)  
in the sum of not exceeding the sum of TEN THOUSAND DOLLARS (\$10,000.00), or Seller's price for the below described used equipment, for the payment of which Seller lawfully binds himself, his successors and assigns jointly by these presents.

**The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below described used equipment originally manufactured by Caterpillar Tractor Co. or any of its subsidiaries:**

Description \_\_\_\_\_  
Model No. \_\_\_\_\_  
Serial No. \_\_\_\_\_

together with certain attachments allied thereto, and

**Whereas Seller guarantees said equipment and attachments against unsatisfactory performance due to defective parts for \_\_\_\_\_ days\* after the date of sale shown below (therein referred to as the guarantee period), the obligation under this guarantee being only to replace any part which proves defective under conditions of normal use during the guarantee period at Seller's expense (including cost of all necessary materials and labor) up to a maximum of the lower of Ten Thousand Dollars (\$10,000.00), or Seller's price for said equipment, except that the cost, if any, of transporting said used equipment and/or attachments from and to the Buyer's place of business shall be paid by the Buyer.**

**Now Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obligations under the guarantee recited above, then this obligation shall be void, otherwise to remain in full force and effect.**

THE ABOVE GUARANTEE IS VOID AND SELLER SHALL BE UNDER NO OBLIGATION THEREUNDER IF CLAIM IS NOT MADE TO THE SELLER WITHIN THIRTY (30) DAYS AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

No guarantee is made or intended to be made by Seller other than that shown on face.

Signed and Sealed: \_\_\_\_\_ 1961

**Signed by your Caterpillar Dealer, this bond gives you up to \$10,000 worth of machine dependability**



Bonded Buy means guaranteed machine dependability. You can get a completely-checked, used Cat-built machine that has the Cat Dealer's confidence and guarantee, PLUS this bond from Lumbermens Mutual

Casualty Company that backs up your machine with as much as \$10,000 worth of parts and labor for the period you and the dealer agree upon.

See your dealer. Read the bond. Check the details. This guarantee can apply on your next used machine. And you pay no extra premium for this assurance. Dependable Bonded-Buy machines are priced right—and your Cat Dealer offers terms to match your needs. Call him or see him soon. Do business with the man whose business is built on dependability.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

# CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Enter 1409 on Reader Card

Magnetorque swing, a P&H exclusive feature, means faster work cycles and more yardage at the end of the day.



## "We need rock and lots of it—that's why

**SAM BRAEN ORGANIZATION,  
WYCKOFF, NEW JERSEY—  
LARGEST PRODUCER OF  
MATERIALS FOR HIGHWAY  
AND PAVING CONSTRUCTION  
IN THE NORTHEAST**

### **Sam Braen, President, reports—**

*"Our 2½ and 3 yard P&H shovels are real 'rock movers.' Magnetorque swings are faster and smoother than anything I've seen in the industry. Our schedule requires rock and lots of it—that's why we use our P&H shovels for this operation."*

### **2 P&H shovels keep production in high gear**

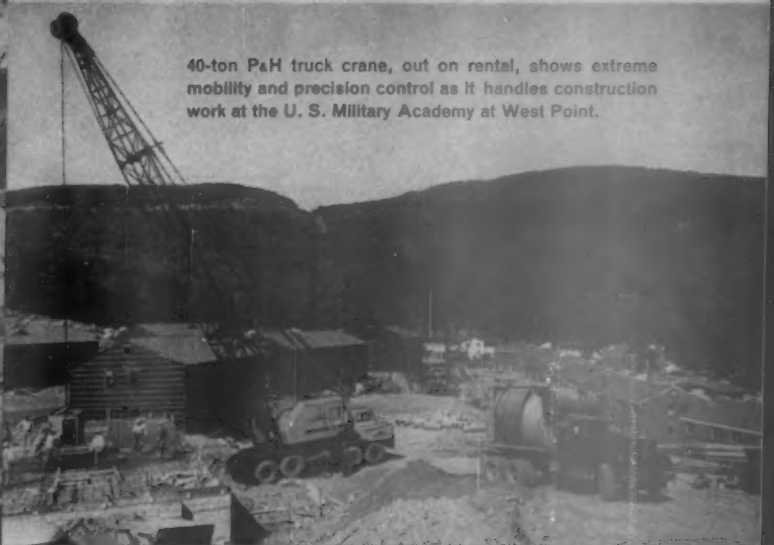
Oscar Dufour, Quarry Superintendent, uses his two P&H rigs to handle all rock excavation for the Riverdale Stone Quarry operation. These two rigs maintain a 20-second work cycle. Magnetorque Drive makes the cycles faster and smoother, permits more accurate loading of the trucks. His operators can work all day without tiring, so he gets more yardage per day.

### **P&H rigs give more efficient, trouble-free operation**

Art Whitesell, operator of the 3-yard P&H, has this to say—"It has plenty of power for rock work . . . and compared to friction clutches that heat up.



For the digging motions, P&H Planetary Chain Crowder and Refractor gives more positive crowding action in the bank and a faster retract.



40-ton P&H truck crane, out on rental, shows extreme mobility and precision control as it handles construction work at the U. S. Military Academy at West Point.

## we use P&H shovels with Magnetorque™

and have to be adjusted, Magnetorque remains the same all day, under heaviest digging. When operating on a slope and swinging up-hill with a load, Magnetorque always swings the machine easily, without over-heating."

### **P&H truck cranes handle other diversified operations**

Walter Jorgensen, Braen's Vice President and Equipment Manager, uses a 40-ton and 60-ton P&H truck crane to handle work at his prestressed concrete division and for his equipment rental business.

In the manufacture of prestressed concrete beams, columns and slabs, the P&H rigs easily lift, move and

stack the heavy sections. They can be moved quickly to the job sites to handle erecting work and from one work area to another to handle a number of jobs with complete safety and accuracy.

In Braen's equipment rental business, the steady demand for the P&H rigs testifies to their outstanding performance . . . more proof that ONE P&H ALWAYS SELLS ANOTHER.

For more detailed information on this job, write for Case History 131—or contact your P&H dealer.

**HARNISCHFEGER P&H**  
Milwaukee 46, Wisconsin

AS YOU PLAN AHEAD, PLAN ON MAGNETORQUE . . . AND CHOOSE THE RIGHT MACHINE FOR YOUR WORK FROM 40 DIFFERENT MODELS . . . THERE'S A P&H FOR EVERY JOB! . . . WRITE FOR "THE FABULOUS 40"

**WELDING ON  
MANGANESE STEEL?  
HARDFACING?**

## TRY THE AMSCO "PAIR FOR WEAR"

**The Most Exceptional Electrodes on the Market Today!**

"Pair up" these rods wherever you need high impact and abrasion resistance. But test them first, and see how the "Pair for Wear" get their reputation for handling ease, fast deposit and high, sound metal bead.

We think you'll like Amasco's "Pair for Wear". Put them to the test. Write us now for your free "Pair for Wear" technical bulletin and test samples of rods.

Available in 50 lb. standard manual packages and 50 lb. semi-automatic coils.

\*Trade Mark Registered



"Buy Through  
Your Local  
Welding Supply  
Distributor"

# AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

Other plants in: Denver • Los Angeles • New Castle, Delaware • Oakland, California • St. Louis  
Welding products distributed in Canada by Canadian Liquid Air Co., Ltd.

Enter 1403 on Reader Card

## PEOPLE IN THE NEWS

(Continued from page 39)



### Kassner retires as U. S. Gypsum manager

THOMAS H. KASSNER has retired as works manager of the Sweetwater, Texas, plant of U. S. Gypsum Co., Chicago, Ill., after 52 years of service. Mr. Kassner joined the company in 1909 at its old Okarche, Okla., plant and in 1914 was named works manager of the Southard, Okla., plant. Ten years later, he became production manager in charge of plants at Southard, Sweetwater and Eldorado, Colo. After serving as western division production manager in Chicago from 1925 to 1942, Mr. Kassner was appointed works manager at Sweetwater.

### McGinnis succeeds Warren at Southwestern Cement

FELIX S. MCGINNIS, JR., has been elected president of the Southwestern Portland Cement Co., Los Angeles, Calif. He succeeds George E. Warren, who has been elected chairman of the board.

Mr. McGinnis recently served as executive vice president. He joined the Fairborn, Ohio, plant in 1940 and later transferred to the Victorville, Calif., plant. Prior to his appointment as executive vice president, he served as vice president and secretary.

Mr. Warren, who joined the company in 1933 as vice president and manager of the Fairborn plant, became president in 1949. A director of the Portland Cement Association, Mr. Warren is also serving on the Cement Advisory Committee of the American Mining Congress. He was recently appointed to the board of trustees of the University of Redlands.

(Continued on page 44)

# IF THE JOB CALLS FOR A SINGLE ROLL — PENNSYLVANIA'S GOT IT

Only Pennsylvania offers you this range of Single Roll Crushers—permitting precise job-engineering of the exact machine for your application.

Pennsylvania Single Rolls furnish the most economical, efficient reduction method you can get for primary and secondary crushing of a wide variety of materials—including cement rock, gypsum, limestone, mine refuse, barytes and other friable ores, shale, slag, chemicals and phosphate rock.

Combining a slow speed operation with high capacities (up to 1200 TPH), all models feature *extremely low maintenance and operating costs.*

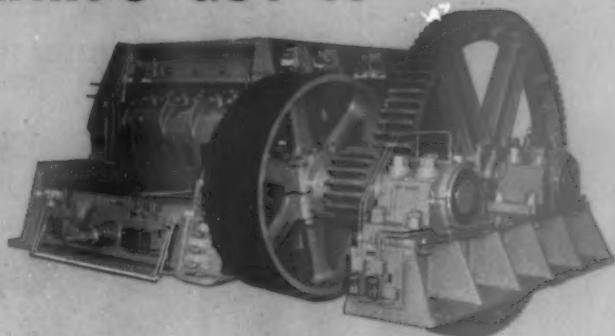
Pennsylvania Single Rolls require very little headroom, can be choke fed, and will handle wet, sticky or frozen feeds without showing noticeable decrease in capacity.

## FREE BULLETINS

Write for Pennsylvania Single Roll Bulletins, fully describing the many design features, operating advantages and application information on these famous "work horses."

### PENNSYLVANIA CRUSHER DIVISION

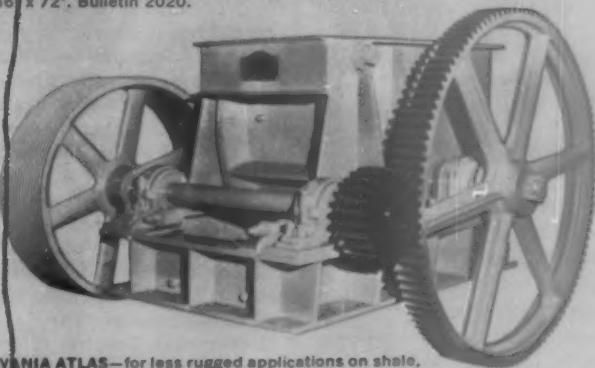
BATH IRON WORKS CORPORATION  
WEST CHESTER, PENNA.



**PENNLEHIGH**—recommended for primary crushing of cement rock, limestone, gypsum and other friables to a nominal 6-8" product in one pass. Capacities to 1200 TPH. Sizes to 48" x 72" Bulletin 2011.



**PENNSYLVANIA HERCULES**—for heavy-duty primary or secondary crushing of cement rock, gypsum, mine refuse, coal with rock, limestone, ores, slag, etc. Capacities to 1200 TPH. Sizes to 36" x 72". Bulletin 2020.



**PENNSYLVANIA ATLAS**—for less rugged applications on shale, slate, coal, fire clay, soft gypsum, soft limestone, chemicals, etc. Capacities to 660 TPH. Sizes to 30" x 60". Bulletin 2025.

# PENNSYLVANIA CRUSHERS

BATH-BUILT





Put the SHAKE to work

# PARA-MOUNT vibratory feeders

RUBBER SHEAR SPRING AMPLIFIERS—RESONANCE-BALANCED EXCITER.

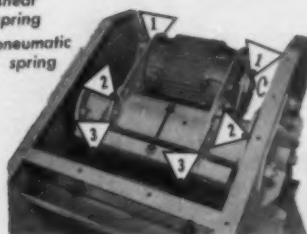


- Simple, rugged drive construction with complete accessibility.
- Operates under material head load with minimum damping and loss of capacity.
- Full size hopper opening reduces arching and assures free flow by vibrating materials at hopper throat.
- Feed rate unaffected by voltage or frequency fluctuations.
- Stepless infinitely variable feed rate control.
- Grizzly bars or screen decks to suit application.
- Heavy channel trough construction with bolted, replaceable trough plate.

## AVAILABLE IN TWO TYPES FIXED RATE and ADJUSTABLE RATE

with capacity up to 750 tons per hour

- 1 counter-weight
- 2 shear spring
- 3 pneumatic spring



Adjustable rate feeders are designed for precise control of material feeding. Pneumatic springs and remote control box provide stepless, infinitely variable material feed rate. Industrial type air springs mounted between trough and exciter unit combine with rubber shear springs to vary the stroke and feed rate in response to remote controlled air pressure. The result is precise feed regulation with negligible air consumption. Can be used in blending or proportioning systems using two or more feeders to provide consistently accurate results. The Para-Mount feeder is used in many process systems requiring automatic feed control such as belt or batch scales, crushers, screens, ovens, dryers, mixers, blenders, etc.

### RESONANCE BALANCED EXCITER

Powered by standard, totally-enclosed 900 RPM motor with sealed ball bearings.

### FIXED RATE FEEDER

Identical to the above except for pneumatic springs and control box. Feed rate adjustable by varying hopper opening, trough slope or motor counterweights.

Bulletin No. 611 Available For Complete Information



132 W. Northwest Highway, Barrington, Illinois

Vibrating Process Equipment

Enter 1401 on Reader Card

## PEOPLE IN THE NEWS

(Continued from page 42)

### OBITUARIES



**James E. Dunn**, newly-elected chairman of the Manufacturers Division of the National Sand & Gravel Association, died suddenly on February 17. He was 64 years old. Mr. Dunn was special representative for the processing machinery department of Allis-Chalmers Manufacturing Co. Widely known in the sand and gravel industry as an authority on vibrating screens, Mr. Dunn had been active in affairs of NSGA for many years. He had been associated with Allis-Chalmers since 1913. Mr. Dunn was also a member of the American Institute of Mining, Metallurgical and Petroleum Engineers.

**Edwin H. Davis**, chairman of the board of Davon, Inc., Columbus, Ohio, died suddenly on December 5. He was 72 years of age. Mr. Davis had been associated with the company for 53 years in many capacities, having served as legal counsel prior to becoming president and then chairman of the board in 1952.

Mr. Davis was an officer or director of many associations and organizations. He was a life member of the Ohio Chamber of Commerce, a member and past director of the Portland Cement Association, a member of the American Institute of Mining & Metallurgical Engineers, Structural Clay Products Association, Ohio Forestry Association and past president of the Ohio State Safety Council.

**Earl D. Smith**, a partner with Thurmon Sneed in the Empire Rock Co., Santa Rosa, Calif., died suddenly December 7. He was 46 years of age.

END

Enter 1402 on Reader Card

# Performance records prove International® best buy!



## NEW UD-817 BACKS VETERAN IH DIESELS ON MULTI-CRUSHER SETUP FOR PLAUTZ BROS., WILLARD, WISCONSIN

Take a look at performance records when you choose power for heavy-duty crushing operations. That's what the Plautz Brothers did, then they bought another International! They checked 27 years of outstanding service—12 years from an International UD-24, and 15 years from an International UD-18. In all that time, the "24" had one part replacement, and the "18" needed a valve job.

The new 250-hp UD-817 supplies power for the first conveyor and the primary crusher, a Universal Breaker that takes 30-inch rock. Next in line is a Pioneer 20 x 36 jaw crusher driven by the 15-year old UD-18. Final unit is a Pioneer triple-deck 40-inch roll with a 4 x 10 screen, driven by the 12-year old UD-24. The plant produces 1,000 yards of 3/8-inch material per 10-hour day.



15 YEARS  
OF SERVICE

12 YEARS  
OF SERVICE



When you need steady, low-cost power for year-in-year-out operation of heavy-duty equipment, check with your nearby International Engine Distributor or Dealer. He'll give you complete information on 35 rugged engines—16.8 to 385 max. hp—plus installation assistance, if you need it. Call him soon.

# INTERNATIONAL® H. ENGINES

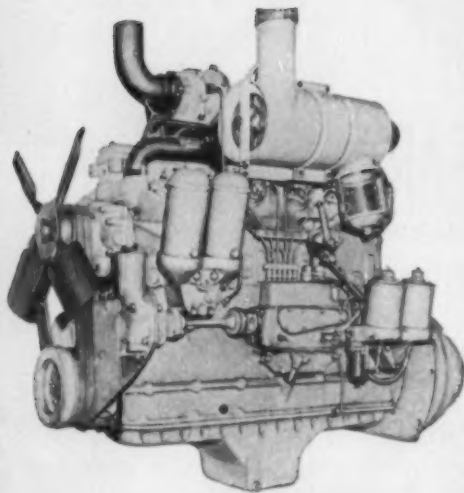
International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Ill.  
A COMPLETE POWER PACKAGE

# NEW International TD-

**...built to "BEEF UP"  
your profit edge!**

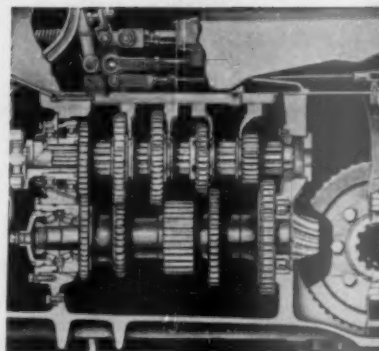
From air intake to new fixed drawbar —from day-to-day dependability through year-in, year-out durability—new strength, new performance protection, new work capacity are built into the new TD-20. Check and compare the advantages of International turbocharged Diesel power, teamed with beefed-to-match new transmission and final drive

components—platformed on a far stronger-than-ever undercarriage —turned into new efficiency by International-built tracks, kept in life-prolonging alignment by exclusive International 3-point suspension. See your International Construction Equipment Distributor for a new TD-20 demonstration.



## **New Turbocharged Diesel Wallop**

Modern turbocharging crams air into the new TD-20's smooth running 6-cylinder engine—to produce extra hp efficiently at all altitudes; and to give a 50% torque rise to lug larger overloads. Crankcase ribs are "beefed up;" cooling, air cleaning, and crankshaft capacity all are increased to team with turbocharging. Push-button TD-20 starting is by famous International gasoline-conversion system!



## **Larger radiator plus jet head increases cooling capacity**

Coolant, under pressure from the new greater capacity radiator, is shot through jets against lower surface of TD-20 heads—to aid heat transfer and avoid build-up of heat-trapping deposits. Fan shroud and radiator guard are "heavied" for increased rigidity.



## **New transmission capacity ...New filtering system added**

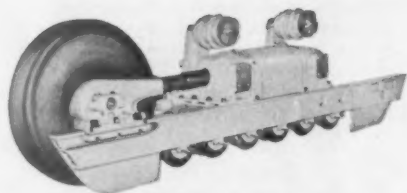
Heavier shafts, more rugged gears, and roller bearings of greater capacity are provided—to carry increased hp and add thousands of hours to working life of power train components. New transmission oil pump circulates and filters life-guarding lubricant. New "short-travel" levers add operating ease.

# 20

(201 SERIES)

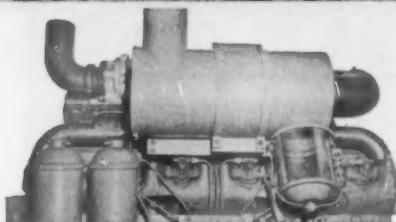


New 140-hp International TD-20 crawler tractor. Develops 113 drawbar hp. Powered by 6-cylinder DT-691 Turbocharged Diesel engine. New capacity 6-speed, full-reverse transmission is controlled by new short-travel gear-shift and Shuttle-Bar levers.



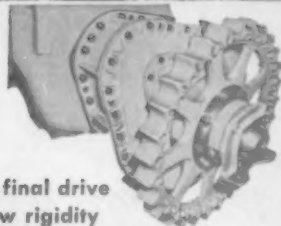
## New Undercarriage Strength and Protection

New drum-type front idlers add strength... International also adds track chain guides to both sides of the TD-20's precision-welded double box-beam track frames! New track roller shields are of cast steel. New heavier strutless track links are self-cleaning and power-saving. The new hydraulic track adjuster, with built-in safety relief is "standard" on the new TD-20. And full-floating seals of increased efficiency guard Dura-Roller life!



## New 99.8% efficient Dry-Type air cleaner

For positive "breathing" safety, the full air volume taken in by turbocharging is "dry-cleaned" of 99.8% of its dirt—by the TD-20 Diesel's new dry-type air cleaner. Handy, under-hood horizontal mounting—and transparent, quick-dump collector—greatly simplify servicing. Dash indicator shows "red" when cleaner element needs washing.



## New final drive ...new rigidity

New TD-20 final drives have been strengthened to deliver full torque turbocharged power to the tracks. New sprocket drive doweling increases housing rigidity—helps maintain precision component alignment. Other major steps ahead in TD-20 design include: new torque-taking, life-adding bimetallic steering clutch discs; new pivot shaft inner spacer; new hardness of sprocket drive pinion shaft.



**International  
Construction  
Equipment**

International Harvester Co.,  
180 North Michigan Ave., Chicago 1, Illinois  
A COMPLETE POWER PACKAGE



## "4-in-1 gives the advantages of several machines in one"

—report mine and quarry owners



"Our 4-in-1 is much more than a loader or a dozer," reports Milton Reeves, for B. S. & K. Mining and Milling Co., Silver Bell, Arizona. "Its lifting and heavy material handling ability is tremendous, and indispensable in our operation." The 1½ cu. yd. TD-9 Four-in-One owned by this zinc and copper mining firm is shown digging compacted, rocky material for haul road repair. This model exerts 19,000 lbs. of power-shovel-like pry-over-shoe break-out force. The rig is also used to load ore on trucks, do clean-up and other key jobs.



"I get the advantages of several different pieces of equipment in one from my 4-in-1," states Paul H. Morris, owner, Morris Enterprises, Owensboro, Kentucky. "My TD-15 rig has way exceeded my original expectations." His 4-in-1 is shown maintaining a haul road at a Morris strip mine. The 4-in-1 also cleans coal seam, loads washed coal when needed, builds haul roads, and is available to help other equipment remove overburden.

"Just like you say," reports Superintendent Ralph Lewis for Dulin Bauxite Company, Murfreesboro, Arkansas, "we can use the International Drott 4-in-1 as a clamshell, shovel, dozer, and other machines. Our TD-15 Four-in-One has helped tremendously in stepping up our production!" Their 2¼-cu. yd. 4-in-1 proved it can outshovel a boom-type shovel loading gypsum, the firm's present product. Note how controlled clamshell bottom dumping allows easing material into truck.

**Why limit your income.** Why restrict the variety and volume of work you can handle, with an old-style, "single-action" rig? See what it means to command "equipment spread" utility in one machine—and get the 4-in-1's multiple-machine earning power for one moderate investment. See your International Drott Distributor for a demonstration!

International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corporation, Milwaukee 15, Wisconsin



**INTERNATIONAL  
DROTT**

# INDUSTRY NEWS



## Electricity parades for cement producers at AIEE conference

A tour of the world's largest breeder reactor atomic power plant is on the agenda for the approximately 500 cement manufacturers, electrical equipment and utilities suppliers who will be heading for a three-day meeting in Detroit. April 18-20 are the dates for the third annual technical conference sponsored by the Cement Industry Subcommittee of the American Institute of Electrical Engineers.

One of the most important technical sessions will be that on automation as related to cement production. A. H. Huelsman of General Electric Co. will act as moderator, and a principal speaker to look forward to is E. A. E. Rich, also of G.E., who will discuss basic concepts involved in automating cement plants. The maintenance and safety session will be highlighted by a talk on "What Do Accidents Cost?" by J. R. D. Brown, Portland Cement Association. Other sessions will cover electric drives and power distribution, and the entire conference will be climaxed by the

banquet featuring C. B. Baker, president, Universal Atlas Cement Co., as speaker.

A wonderful opportunity is also provided for those in attendance to tour the Enrico Fermi Atomic Power Plant at Monroe, Mich. (mentioned above) and the operations of the Dundee Cement Co.

## Kennedy speeds up highway allotment

Alleviating unemployment and construction decline was one of the prime motives behind President Kennedy's direction to the Secretary of Commerce to make immediately available to the States the "contract control" allotment for April, May and June. This fourth quarter allotment, approximately \$724 million, would not be available normally until April 1. It is part of the \$2.874 billion reimbursable obligation schedule for fiscal 1961.

In a special economic message to Congress, the President said

that he has asked the Secretary of Commerce to recommend means of increasing the flow of Federal funds into actual new construction if conditions seem to demand such action.

## Denver gravel producers alarmed—supply is waning

Less than a 15-yr. supply of sand and gravel remains in the Denver, Colo., area, according to reports by the Colorado Sand & Gravel Producers Association. It predicts construction costs will skyrocket unless the following 6-point program is endorsed by the metropolitan area.

(1) It must be recognized that sand and gravel can be mined only where deposits exist.

(2) Temporary sand and gravel districts should be established as an integral part of the master zoning plan. After all sand and gravel has been removed and the land refilled, it can fall into proper zoning, depending on its present surroundings.

(3) Permits for extraction of sand and gravel at any location in the metropolitan area should be limited to five years, with renewal possible on performance.

(4) Rules and regulations to govern sand and gravel removal operations should be adopted.

(5) Provisions should be made for land restoration in keeping with surrounding land use at all sand and gravel operations.

(6) A performance bond in keeping with the capital investment should be required to insure land restoration.

(Continued on page 52)

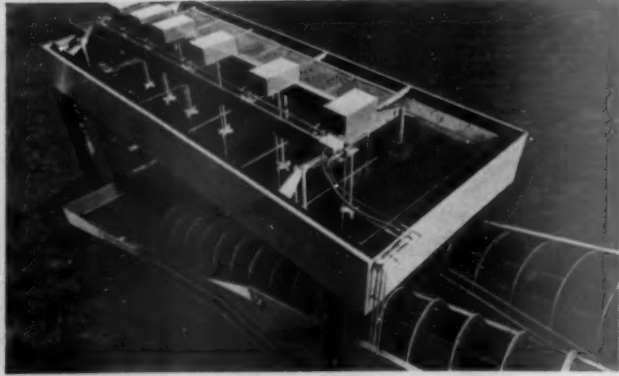
# "We Can Closely Control Classification . . . . . Which Heretofore Had Been A Real Problem To Us"

*Says: W. A. Carson, President*

*Helena Sand and Gravel Co., Helena, Montana*

The Eagle Portable Sand Washing-Classifying-Dehydrating Section shown at right is at the plant of Helena Sand & Gravel Co. Harry Baker, Superintendent, shown, likes the convenient controls. W. A. Carson, President, states, "One of the outstanding features of this Eagle equipment is that we can closely control classification, which heretofore had been a real problem to us. We are making concrete sand, plaster sand and masonry sand and special-use sands that offer a constant service that is helpful in our public relations as well as our sales". The Eagle Portable Sand Section can read-

ily be hauled across the pit or across the state, yet it performs just like a stationary sand washing section. Can be hauled right to the operations site, electric and water connections quickly made and it's ready to operate. Consists of Water Scalping-Classifying Tank and two Single Screw Washer-Classifiers-Dehydrators. Each can be regulated to produce a different material gradation or both can produce the same gradations if desired. When the photo was taken, Helena's Portable Section was producing concrete sand and masonry sand simultaneously.





***Real Ingenuity Went Into Designing This Eagle Sand Section  
... It's Paying Off For Producers!***

A Michigan producer operating a number of deposits can move the Eagle Portable to the pit where it is needed. If both washers are producing the same gradation, the adjustable discharge chutes are arranged to deposit on a single belt, as shown at far left. This producer also operates several Eagle Stationary Sand Washing Sections.

Canadian producer takes Eagle Portable Sand Section, shown at left, to a location near the job site, instead of trucking sand to the job. Note that in this case two gradations of material are being produced and discharge chutes are arranged so that each deposits on a separate conveyor belt. When not out on a contract this Portable helps build stockpiles at home base.

All adjustments and controls are simple and readily accessible. Long handled wrenches provided, as

shown at far left, for adjusting metering "splitter" gates below the tank while plant is in operation. Extra V-belt drives are provided to allow setting of screws at proper RPM for each individual product. Electrical control cabinet at ground level contains push button motor control stations, main circuit breaker and bleed valve control switches.

The Eagle Portable Section uses same efficient electric-hydraulic system for control of bleeder valves as used at stationary plants. Rugged, they are unaffected by travel. Only requirement is that tank be fairly level for operation and jacks are provided to trim unit level at each installation. Height of tank and controls is no greater than most moving vans, so that highway travel is by no means restricted. Send for Catalog 61, giving full details.

**EAGLE IRON WORKS**

ENGINEERS • MANUFACTURERS  
137 HOLCOMB AVE., DES MOINES, IOWA



## INDUSTRY NEWS

(Continued from page 49)

### Book details air pollution problems

A staff of experts gleaned from universities, industry and government bureaus has collaborated on the American Industrial Hygiene Association's Air Pollution Manual: Part 1, Evaluation. Among the many subjects

covered with convincing thoroughness are: economic effects of air pollution; its effects on human health, animal welfare and vegetation; stack sampling procedures and results; community air sampling; chemical procedures; odor control; radioactivity dangers, and meteorological factors. Present and past legislation in the field is discussed with regard to both states and local units. The authors al-

so report on particulate matter concentrations in selected locations. And the human aspect, as exemplified in community relations and the industrial good neighbor policy, is by no means neglected.

### New truck scale patented

A portable pneumatic truck weighing scale has been patented by Ralph R. Miller, Cowan, Tenn. Low-cost and simple in construction, the scale is as readily adaptable to weighing livestock and other farm products as it is to weighing trucks and heavy equipment in the rock products industry. It is easily disassembled and set up, consisting basically of a pair of parallel runways each provided with two individual inflatable cushions which support the load. These are able to register either total weight or any single or combined loads.

### Ideal opens cement distribution terminal

Eugene, Ore., is the site of Ideal Cement Co.'s cement distribution terminal. Consisting of two large storage bins, an office and warehouse, the terminal is midway between Ideal's production facilities at Gold Hill and the Portland-Vancouver area. Ray Murray, sales manager, reports that it is equipped to receive bulk or packaged cement, either by rail or truck.

### Ohio firm acquires mineral wool holdings

Santeler Brothers, Inc., Columbus, Ohio, has entered the home insulation field as a supplier. It recently purchased the McMahon Supply Co., mineral wool division, whose Orrville plant is one of two such manufacturers in the state. The new acquisition will be operated as a subsidiary under the name of Santeler Mineral Wool Corp.

(Continued on page 54)

## JOB REPORT CLEANING QUARRY FLOOR



"Balderson U-dozers have doubled our production. We use our U-dozer in stockpiling and in cleaning quarry floors to move 100 ton per hour over a 800 foot distance. We like our Balderson U-dozer very much because we get more tonnage in less time."

C. L. Holley, Supt.  
Gifford-Hill & Co. Inc.  
Bridgeport, Texas

**BALDERSON**  
WAMEGO KANSAS

**INC.**  
U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Please send me more information on teaming Balderson blades with Caterpillar Traxcavators. I am mainly interested in a \_\_\_\_\_ (type)

blade for a \_\_\_\_\_ (model) Caterpillar.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Enter 1407 on Reader Card

ROCK PRODUCTS, April, 1961

Enter 1408 on Reader Card

**PRODUCTION FACTS ON A**

# **Power Shift Traxcavator**



**25-SECOND CYCLE TIME!** De Bord Bros. of San Antonio have a new 955 Traxcavator excavating and truck-loading bank-run gravel. "It averages 25-second cycles; loads a 5-ton truck in 75 seconds with about two and a half bucketfuls. Could handle 40 trucks an hour if necessary." De Bord Bros. watched a Traxcavator completely outperform a competitor in a demonstration . . . and then made an easy choice: the 955H.

**THE HOW AND WHY OF 955 PRODUCTION:** 100 HP, 1 $\frac{1}{4}$  yd. standard bucket; finger-touch Cat power shift transmission; automatic bucket positioners. Add a competent operator, and you've got perpetual motion of bulk material.

## **TRAXCAVATORS WORK FAST**

**POWER SHIFT TRANSMISSION.** One lever gives split-second changes in speed or direction to slash cycle time, keep operator fresh and efficient.

**LIVE ACTION HYDRAULICS.** You get faster lifting and more digging capacity without robbing power from the tracks.

**FAST ACTING CONTROLS.** Easy to operate. Automatic bucket positioner and lift kickout speed operation. Excellent visibility and safer design improve operator efficiency.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U. S. A.

**GET A DEMONSTRATION.** See your Caterpillar Dealer for a complete description of the line of front end loaders (track or wheel-type) . . . and a knowledgeable recommendation of the best machine for your job.

## **CATERPILLAR**

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

**TRAXCAVATORS  
ARE MAKING OTHER  
LOADERS OBSOLETE**

Here is the  
**SUPER-DUTY**

# **Cape Ann Alloy DROP BALL**

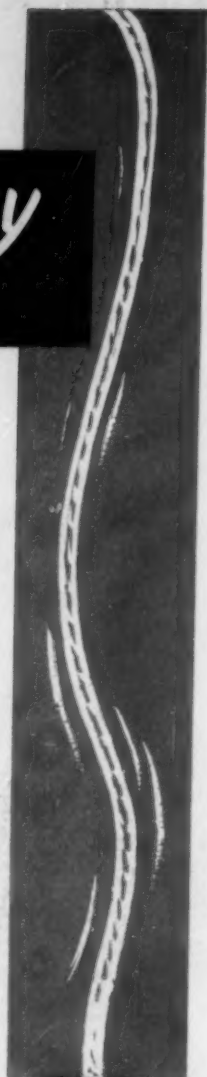
**for long-  
rugged service**

**FORGED** and **HEAT TREATED**  
from abrasive resisting **ALLOY**  
**STEEL**. Specifically designed  
for rugged service. Economical,  
dependable secondary  
breakage! **SONIC TESTED** before  
shipment.

## **FULLY GUARANTEED!**

"Cape Ann" will continue to  
offer its regular line of  
**FORGED** steel drop balls to  
those operators not requiring  
this Super Duty Drop Ball.

**CAPE ANN**  
**ANCHOR & FORGE CO.**  
P.O. Box 361  
**GLOUCESTER**  
**MASS.**



## **INDUSTRY NEWS**

(Continued from page 52)

### **Flintkote gains 99-yr. rights to Newfoundland gypsum**

Some 3,000 sq. mi. of Newfoundland gypsum producing properties, including facilities at Flat Bay, have been turned over to Flintkote Co. to furnish raw materials for the company's new U. S. and Canadian plants.

Under a 99-yr. renewable lease, Flintkote has agreed to pay the Government of Newfoundland 5¢ per long ton of gypsum rock produced, together with other considerations. Flintkote is planning to develop export shipping facilities, and for \$1 million will acquire certain assets of the Atlantic Gypsum Co. Ltd. at Corner Brook. It will manage the plant for the Province, with the right for eventual outright purchase.

### **Adams, Mass., expects new industry**

Hopes for a new industry were awakened in Adams, Mass., when the Georgia Marble Co. of Tate, Ga., purchased an idle limestone quarry in the town. The sale, reported to involve \$195,000, in-

#### **What's coming in May**

Virtually inexhaustible supplies of dolomitic limestone furnish the raw materials to make refractory-grade magnesium oxide. The May issue of Rock Products will describe how H. K. Porter reacts limestone with seawater to obtain the ingredients for their line of valuable and useful basic refractories.

cludes the vacant Berkshire Street Railway Co. carbarns and land lying south of them that were formerly owned by the Hooker Chemical Company.

William Tate, vice president of the Georgia company, said that he will disclose the company's plans for operation of the properties after a trip to the site.

(Continued on page 57)



Just **RIP**  
**TIP** and **POUR**

You don't have to mix these  
new economy blasting agents

**DU PONT**  
**NILITE**<sup>®</sup> 101  
AND 202

The minute you tear the corner off your first 50-lb. bag of "Nilite" 101 or higher-density "Nilite" 202, you'll enter a new era in blasting.

Now at last you have two low-priced, free-running blasting agents that give you Du Pont quality performance, shot after shot.

You don't mix "Nilite" on the job. You don't mix it at all. Just rip open the bag and pour it into any hole—small, medium, large—from 2" diameter up. No clogging, no bridging in the hole.

No clouds of dust, and no ingredient to cause headaches. No messy oil-stained bags.

But easy loading is only part of the story of "Nilite." For full data on rock-breaking power, better propagation, greater safety and other advantages, send for our new fact sheet on "Nilite" or call your Du Pont distributor or representative. Start saving on your blasting . . . soon. Du Pont, Explosives Department, 6440 Nemours Building, Wilmington 98, Del.

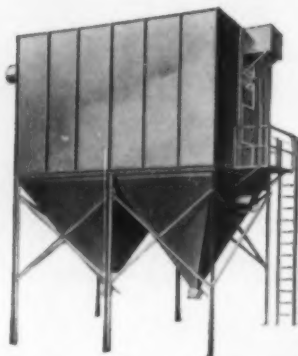
*Flows freely  
even in  
holes as  
small as...*



BETTER THINGS FOR BETTER LIVING  
...THROUGH CHEMISTRY

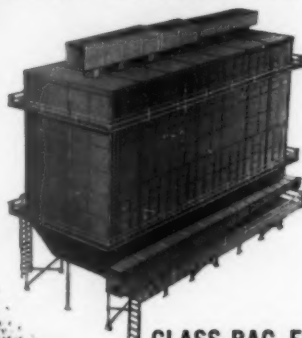
**NILITE**<sup>®</sup>

► freedom from almost any dust



MULTI-BAG FILTERS

► freedom from hot, corrosive dust



GLASS-BAG FILTERS

► freedom from small or local dust problems



UNI-FILTERS

#### BAG-HOUSE COLLECTORS

Dracco can also design, engineer and fabricate bag-house type collectors, where know-how in the application of qualified components is essential.

# THE NEW PLANT DIMENSION... freedom from dust

► freedom from dust thru cyclonic collection



WHIRL-CLONES

Freedom from dust is a new plant dimension that measures administrative excellence as well as production efficiency.

Advanced manufacturing techniques, coupled with a nation-wide campaign against air pollution, have established need for a new high order of dust control. The Dracco collectors shown here, backed by 40 years experience in dust control engineering, can prove invaluable in your fight for clean plants and clear skies.

A new 28-page brochure "FREEDOM FROM DUST" includes full technical and application data on Dracco's complete line of dry collection equipment. Write Dracco Division of Fuller Co., Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

**DRACCO** airstream conveyors  
dust control equipment



Enter 1469 on Reader Card

## INDUSTRY NEWS

(Continued from page 51)

### Purdue fellowships to be granted by PCA

Twenty fellowships to Purdue University's Graduate School will be made available on a free-grant basis for the next summer session, June 19-Aug. 11, thanks to the Portland Cement Association. Eligible are qualified instructors and members of civil engineering departments who will benefit from a study program including courses in concrete and aggregates, highway planning, economics and pavement design, supplemented by a symposium conducted by outstanding authorities in highway engineering.

PCA pays for tuition, fees and transportation expenses, and grants an additional cash stipend of \$700. For more information and application forms, contact Professor K. B. Woods, School of Engineering, Purdue University, Lafayette, Ind.

### Mexican industry stepped up by \$16 million cement plant

A corporation headed by a La Mesa, Calif., woman, Mrs. Esther L. Hart, is building a portland cement plant in Baja California, Mexico to produce 1,000 tons per day. The plant of San Vincente Cementos Portland, S. A. is located 55 miles south of Ensenada, and adjacent to the firm's 120-million-ton limestone quarry, said by engineers to contain a 220-year supply.

Mexico will have first chance at the production, and will probably use about 75 percent of the output to meet its growing building and industrial needs. San Diego builders will also make use of the firm, due to probable lower rates. A Far East market was originally offered to the plant to consume the next four years' output.

(Continued on page 58)

## BELT INSTALLATION MEN LIKE TO WORK WITH...

# FLEXCO® BELT FASTENERS



Lowell Lynde, Service Engr., Barber-Greene Co. completing the installation of a FLEXCO splice.



Cutaway of a FLEXCO application showing the compression plates, teeth and precision-made bolts and nuts.

He says, "I've spliced most of the belts our Chicago office has sold throughout Illinois and northern Indiana. FLEXCO fasteners have been used on all of them without any trouble. They are easy to install and hold up well regardless of the material conveyed."

### PROTECT YOUR INVESTMENT IN CONVEYOR BELTS

**WITH FLEXCO . . .** the quality fastener for all heavy-duty conveyor belt applications: COAL & METALS, SAND & GRAVEL, CRUSHED ROCK, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

ORDER FROM YOUR DISTRIBUTOR, OR WRITE TO US FOR BULLETIN F-112.

"FOR THE SPLICE OF A LIFETIME"

## Flexible STEEL LACING COMPANY

4664 LEXINGTON STREET

ROCK PRODUCTS, April, 1961

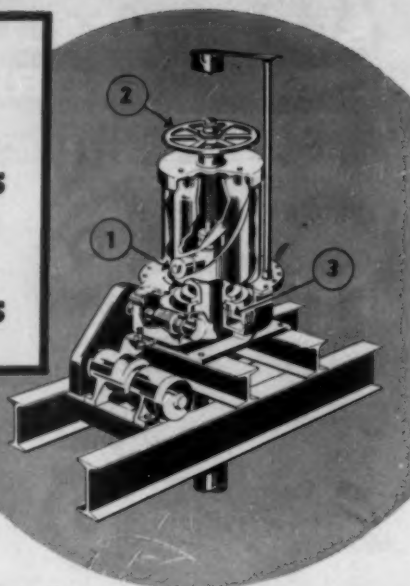
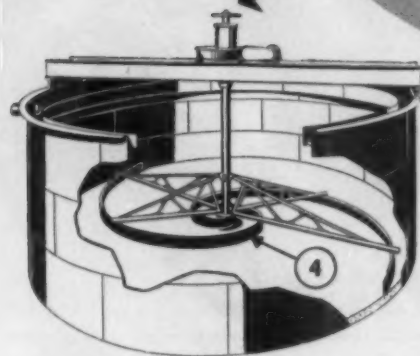
### FLEXCO "25-PAK"



"25-PAK" contains enough fasteners to join common belt widths.

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# Hardinge THICKENERS and HYDRO- SEPARATORS



1. "Auto-Raise" device.
2. Manual or power raise.
3. Replaceable ring-type ball bearing support.
4. Spiral rakes, and "froth rings."

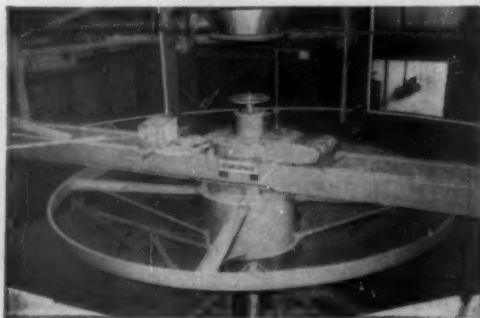
The higher the solids content in the thickener underflow, the lower the cost of filtering for subsequent processing or disposal.

The spiral rakes of the Hardinge Thickener compress the solids to maintain high density of underflow.

The "Auto-Raise" drive mechanism prevents overloading as the underflow is thickened.

Submerged parts may be supplied with rubber or lead covering or fabricated from wood or any metal available for structural parts.

Complete specifications upon request.  
Bulletin 31-D-7.



Also available are "froth rings" for froth-free overflow and superposed type tank construction (as shown above) for minimum floor space and building economy.

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BIRMINGHAM

## INDUSTRY NEWS

(Continued from page 57)

### All sorts of bonuses with good highway system

At the recent annual meeting of the Alabama Road Builders Association, speaker Ellis L. Armstrong, president, Better Highways Information Foundation, brought to light a 1894 tribute to a fine highway system.

Addressing the Minnesota Good Roads Convention that year, Professor W. W. Pendergast said: "To sum up, a perfect highway is a thing of beauty and a joy forever. It blesses every home by which it passes. It brings into a pleasant commun-

### What's coming in May

Now that the Supreme Court has resolved the depletion question for the portland cement industry, the next question is, "What's ahead for depletion?" Joe Bell, special features editor, will discuss this vital subject in May, Rock Products' annual cement issue.

ion people who otherwise would have remained at a perpetual distance. It awakens emulation, cements friendships, and adds new charm to social life. It makes the region it traverses more attractive, the residences more delightful; it stimulates a spirit of general improvement. Fields begin to look tidier, shabby fences disappear, gardens show fewer weeds, lawns are better kept, the houses seem cosier, trees are planted along its borders, birds fill the air with music, the world seems brighter, the atmosphere purer. The country sinks from view. The schoolhouse and the church feel the magic influence—the wand of progress has touched even them; the old are young again, the young see something now to live for, and to all life seems worth the living."

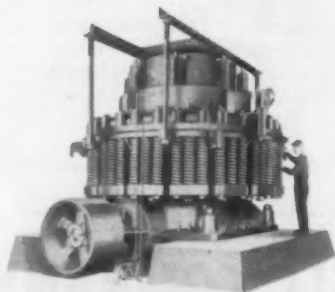
(Continued on page 61)

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# Dolomite

the "building blocks" of progress



**SYMONS® CONE CRUSHERS**  
... The machines that revolutionized crushing practice ... are built in a wide range of sizes, for capacities to over 1500 tons per hour. Write for descriptive literature.

When Nature adds magnesium to limestone, the result is *dolomite*. In the form of crushed aggregate, it is used for road building, in concrete dams and other engineered construction projects. As crystalline dolomite marble, it is used as ornamental building stone. And because of its magnesia content, it is widely used in making refractories for open-hearth furnaces and Bessemer converters. Found in massive beds throughout the world, dolomitic limestones are truly the building blocks of progress.

In processing this rock-mineral, Symons Cone Crushers have again maintained their leadership in high capacity, low-cost production of finely crushed product. *For in dolomite as in all important rock and ore crushing operations around the world, Symons Cone Crushers are first choice of leading producers.*

SYMONS... a registered Nordberg trademark known throughout the world.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

**NORDBERG**



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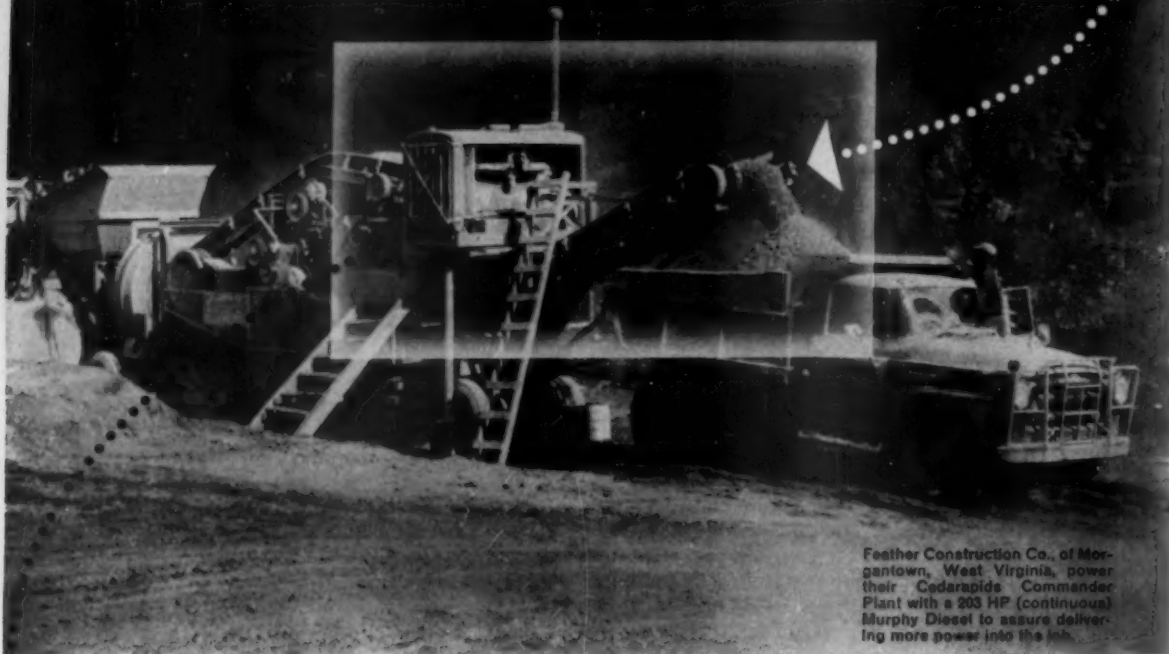
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ROCK PRODUCTS, April, 1961

# Profitable Production HERE



Feather Construction Co., of Morgantown, West Virginia, power their Cedarapids Commander Plant with a 203 HP (continuous) Murphy Diesel to assure delivering more power into the job.

## demands **MORE POWER DELIVERED INTO THE JOB** with a **MURPHY MP DIESEL**

Take a look at the amount of aggregate coming off this delivery conveyor. That is profitable production! It goes on like this hour after hour, day after day, because all the power from the engine is put *into* the job . . . usable power that's delivered where it counts for maintaining high daily tonnages.

MP Series Murphy Diesel engines are designed and built to react to load changes immediately, with the high rising torque that delivers More Power *into* the job when needed. Murphy Diesels have the ability to take hold of a load and really

hang on, to help keep your plant at the right operating speed under the toughest crushing conditions.

Power that's merely *on* the job can't increase your plant's productivity. It's the *total usable power delivered into* the job each day which determines that day's production, and profit. Be sure you are getting maximum output from your plant . . . put Murphy MP Power in your job today. Your Murphy Diesel Dealer has full details about Murphy's new MP Concept of Power.

435-PD

### MURPHY DIESEL

Here's the MP Series line-up  
for construction

MP SERIES ENGINES AND POWER UNITS  
—105 HP to 420 HP, 1200 and 1400 RPM

MP SERIES GENERATOR SETS — 70 KW  
to 227 KW

MP SERIES MECH-ELEC UNITS for delivering  
mechanical or electrical power separately  
or simultaneously

MP SERIES DUAL FUEL ENGINES—147 to  
242 HP

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## MURPHY DIESEL COMPANY

5315 West Burnham Street

Milwaukee, Wisconsin

SALES . . . PARTS . . . SERVICE

Throughout the Nation

## INDUSTRY NEWS

(Continued from page 58)

### Papers on pavement roughness ready

Highway Research Board Bulletin 264, Road Roughness and Skidding Measurements: 1960, presents two papers given at the 39th annual meeting in January, 1960. The first, "Devices for Recording and Evaluating Pavement Roughness," is by F. N. Hveem, materials and research engineer, California Division of Highways. Hveem delves back into history for an interesting account of the earliest measuring devices up through and in-

cluding the methods currently employed in California.

Combating the problem of slippery pavements is the subject of "Measurements of Pavement Friction by a Declerometer". Terrence M. Allen, Michigan State University Highway Traffic Center, and Jack H. Dillard, Virginia Council of Highway Investigation and Research, are the authors.

Copies may be obtained for \$1 each from the Highway Research Board, 2101 Constitution Ave., N.W., Washington, D.C.

### Construction contracts climbed for record November

All three major construction categories showed gains in November 1960, rising to make it a record month. Heavy engineering contracts ranked 50 percent above November 1959, with public works contracts up 44 percent and utilities soaring to 77 percent above the preceding year. Non-

residential buildings went up 14 percent; residential buildings, due to a sharp gain in apartment building contracts, rose 15 percent. An F. W. Dodge Corp. report attributes the 1960 rise over 1959 to the far-reaching effects of last year's steel strike. Comparative figures follow:

	November 1960 (000)	November 1959 (000)	Percent change
Non-residential	\$ 915,683	\$ 800,651	plus 14
Residential	1,253,001	1,092,379	plus 15
Heavy engineering	717,447	479,796	plus 50
Total construction	\$ 2,886,131	\$ 2,372,826	plus 22
	11 Months, 1960	11 Months, 1959	Percent change
Non-residential	\$11,258,213	\$10,611,838	plus 6
Residential	14,248,557	16,164,806	minus 12
Heavy Engineering	8,135,845	7,292,686	plus 12
Total construction	\$33,642,615	\$34,069,330	minus 1

### Wecker reports overcapacity worst cement problem

Demand for cement in 1961 will probably utilize only 73 percent of the capacity of the country's cement clinker producing plants, estimated at 436.5 million bbl. This alarming prediction was made by W. A. Wecker, president of the Marquette Cement Manufacturing Co., before the Ready Mixed Concrete Association of Wisconsin at its January 11 meeting.

The production capacity not needed, Wecker continued, is the equivalent of the output of 46

average-sized cement plants. The industry may take a long time to catch up with present capacity; then again, it may never catch up. Marquette statisticians estimate that cement use in the continental U. S. last year was down 7 percent from 1959, and will rise only 3 percent in 1961.

Construction and allied industries, up to now blessed with a backlog of projects, will more closely reflect the fluctuating economy in years to come.

(Continued on page 63)

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# NORDBAK

Tough, Resilient,  
Non-Metallic

Here it is! NORDBAK . . . the manganese backing you pour at "room" temperature." You simply mix the contents of two cans together and pour!

Field tests and on-the-job experience show that NORDBAK really works! Because it's resilient and non-shrinking, it provides excellent backing. It's so tough that in a prolonged test the manganese wore through in spots, but NORDBAK remained uncracked. It's easily removed at changeout, too. You can store NORDBAK at your operations . . . get a supply to keep on hand, ready for the next time you replace liners.

Call, wire or write your order for NORDBAK!



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## NORDBERG MFG. CO.

Milwaukee 1, Wisconsin

Pre-Engineering by **KAISER ENGINEERS**  
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**Raw Materials?** Your final decision to expand or build results from a series of important individual decisions. Raw material availability is one of them. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. In addition, KE is an experienced designer and builder of all types of facilities for the Minerals Industry. From Pre-Engineering through design and construction Kaiser Engineers provides complete one-company service and Ingenuity based on years of experience.



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## INDUSTRY NEWS

(Continued from page 61)

### Calcium hydroxide affects cement hydration

According to many cement chemists, the hydration products of portland cement are formed in solution. Solid calcium hydroxide influences the hydroxyl and calcium ion concentrations, making it important to know the exact equilibrium relationships. The investigation of its activity solubility product is reported in Portland Cement Association Research Bulletin 116, "The Thermodynamic Functions for the Solution of Calcium Hydroxide in Water," by S. A. Greenberg and L. E. Copeland. The study is reprinted from The Journal of Physical Chemistry, Vol. 64, August, 1960, p. 1057.

### Ideal's Alabama plant expands again

A \$1,500,000 expansion program, the second in two years, is getting underway at Ideal Cement Co.'s Mobile, Ala., plant. The storage facilities located at the State Docks will be increased by six new concrete cement silos, 30 x 160 ft., plus two smaller bins and direct loading (including truck scales and conveyor belts) for bulk cement trucks. Total capacity will be increased by 100,000 bbl., to reach a capacity of 234,000 bbl.

Last summer a \$1,400,000 project, consisting of a 200-ft. concrete stack and an electrostatic precipitator, was put into operation.

### Southern Pacific announces 1960 scholarship awards

Two winners were named to receive \$1,000 college scholarships from Southern Pacific Milling Co. The awards, made annually to two outstanding students from the tri-counties of Ventura, Santa Barbara and San

Luis Obispo, Calif., were won by Jimmy E. Throckmorton of Oxnard, and Raymond Klosterman of Santa Maria.

This is the fourth year that Southern Pacific has awarded scholarships to students to help them prepare for careers in the field of Civil Engineering. The program was initiated as a substitute for the practice of giving Christmas gifts to customers and friends. President P. E. Holmes said that the idea has met with enthusiastic response from its inception.

### Japan's record cement plant export goes to Philippines

Cement plant equipment worth \$4.5 million is being sent by Kawasaki Dockyard Co., Kobe, Japan, to Mindoro Island in the Philippines. This record export will be used to construct a cement plant installation, complete with limestone quarrying and harbor loading facilities, capable of producing approximately 12,000 tons per month. The Japanese government is paying for the equipment, which is part of wartime reparations payment to the Philippines.

### Cement companies report 1960 net incomes suffered

The U. S. Supreme Court ruling on depletion allowance, augmented by hampering weather conditions throughout much of the country, resulted in a considerable drop in net incomes last year. Here are a few of the comparative figures reported.

	1960 net Income	1959 net Income
Alpha Portland Cement Co. . . . .	\$4,809,196	\$ 5,779,328
Marquette Cement Manufacturing Co. . . . .	9,404,413	9,490,897
Penn-Dixie Cement Corp. . . . .	6,313,110	7,928,952
Ideal Cement Co. . . . .	13,704,449	17,708,977
General Portland Cement Co. . . . .	9,950,600	12,057,300
American Cement Corp. . . . .	3,944,560	5,861,555
Keystone Portland Cement Co. . . . .	1,454,899	1,788,457

(Continued on page 65)



*Just mix  
and pour*

# NORDBAK

It's Simple,  
Safe and Sure...

It had to happen...someone was bound to find a way to end the problems of backing manganese crusher parts with molten metal!

Now...you can do it with NORDBAK!

It's mixed at "room temperature" and poured right from a can into the crusher cavities. Gone is the need for special melting and pouring equipment...and gone are the hazards of pouring hot metal.

A trial order will prove, inexpensively, NORDBAK's many advantages.

Call, wire or write your order  
for NORDBAK!



## NORDBERG MFG. CO.

Milwaukee 1, Wisconsin

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# 4 ways to make more money



Marcy CPD Rod Mills, Akins Sand Classifiers, Akins Separators, and Marcy Scrubbers were developed for the stone products industry. They are being used by many producers to increase profits by decreasing costs; and by increasing markets through preparation of better products and a wider range of products.

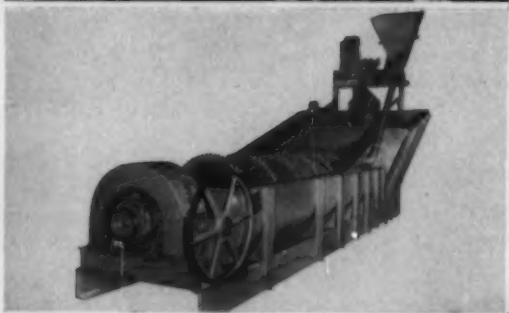
## 1 Washing and Classifying with Akins

**Classifiers.** With the Akins Classifier you can wash, deslime, dewater, and remove or save sand sizes as desired. A large *working* pool area in a classifier is required to do this work...The Akins gives you more working pool area per dollar.



## 2 Grinding with Marcy CPD Rod Mills.

Grinding stone or waste pea gravel in a Marcy Mill results in a superior, cubical product for blending to meet the most rigid specifications. Marcys have kept many small operators in business; and, have been used on almost all large government dam jobs.



## 3 Separating with Akins Heavy Media

**Separators.** Many deposits can be most efficiently treated by the Akins heavy media process. The Akins' large *working* pool area permits close control of products from feed of variable quality or quantity. Reduced media recirculation in the Akins results in lower total horsepower required.



## 4 Scrubbing with Marcy Heavy Duty

**Scrubbers.** Thorough, efficient removal of clay from sand can be accomplished with Marcy Scrubbers. The Marcy principle of small diameter, long length scrubbers gives longer retention time, more contact for scrubbing, less short-circuiting, and lower horsepower...a principle which has been proven on difficult washing of iron ore.

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Europe) and in principal cities of the United States.

## INDUSTRY NEWS

(Continued from page 63)

### American-Marietta adds sand companies

Business and assets of Manley Sand Co., Rockton, Ill., and its affiliate Portage-Manley Sand Co., will be acquired by American-Marietta Co. Cash and securities totalling \$4,825,000 will change hands, as well as plants and silica sand deposits at Portage, Wis., Oregon and Savannah, Ill., Festus, Mo., Michigan City, Ind., and Sawyer, Mich.

Manley Sand Co., which has been serving the foundry and glass industries and other important customers since 1907, will continue operations under its own name as a Division of American-Marietta. Karl O. Geng will remain president.

### Neville Island gets another cement plant

Marquette Cement Manufacturing Co., Chicago, has long-range plans to develop a cement plant on Neville Island. It recently acquired the Green Bag Cement Co., formerly a subsidiary of Pittsburgh Coke & Chemical Co., and in this conjunction takes over a parcel of land at the upper end of Neville Island. The deal provides for an exchange of land between Pittsburgh Coke and Green Bag so that the new plant can be located near and incorporate with the existing one.

Although Marquette's plans are not presently crystallized, it does intend to produce portland cement in a major way. To this end it has taken options on limestone properties near Morgantown, W. Va.

### January construction spending fell

The January rate of spending on new construction was down almost 2 percent from December,

after seasonal adjustment. Value of construction put in place was off 15 percent, compared with a normal seasonal decline of 13 percent. Construction outlays came to \$55.3 billion, as against \$56.4 billion in December. Actual outlays for private construction projects were off 12 percent from December and 4 percent from the previous January. And publicly financed construction sank to 20 percent below the preceding month, as opposed to the normal 17 percent decline. For this, highway projects and non-residential public buildings were mostly to blame.

### Cement industry thrives in Pakistan

A cement factory capable of producing some 70,000 tons annually is in the planning stage at Chittagong. Although a private venture, the project will receive the support of the Pakistan Industrial Credit & Investment Corporation.

The Zeal-Pak Cement Factory at Hyderabad is adding a fourth kiln, which will raise total production capacity to 480,000 tons per yr. The Pakistan Industrial Development Corp. has placed orders for machinery and plant with the firm of F. L. Smidth, Lubeck, West Germany.

### Sole Panama cement company ups production

Cemento Panama, S. A., the only cement producer in Panama, shipped 569,145 bbl. of cement during 1959. Of this number, 508,524 bbl. were sold within Panama; 56,840 bbl. went to the Canal Zone, and the small balance was exported. These figures represent quite an increase over 1958's sales total of 388,545 bbl.

A new \$3 million plant is in prospect for the Caribbean coast of Panama. Cemento Atlantico, S.A. will have a daily capacity of 3,200 bbl.

END

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*Just mix  
and pour*

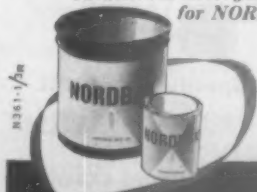
# NORDBAK

It's the modern,  
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to back manganese

Non-metallic NORDBAK streamlines crushing operations of every kind. It's as easy to use out in the field as it is in the plant. You mix it and pour it right on the job...wherever your crusher is. No need for special melting or pouring equipment. Use it in gyratory crushers, cone crushers, grinding mills and other machinery where backing agents are required.

NORDBAK fills voids as narrow as  $\frac{1}{8}$ " and is only  $\frac{1}{4}$  the weight of other backing agents. Conveniently packaged, NORDBAK is the one modern, effective backing agent for manganese crusher parts!

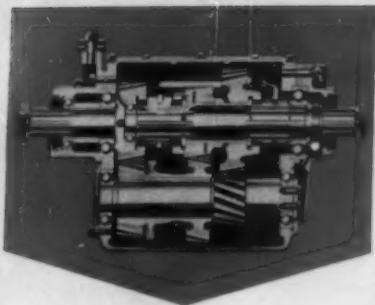
Call, wire or write your order  
for NORDBAK!



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**FULLER**  
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 3-SPEED AUXILIARY**

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MODEL	SPLITTER RATIOS		DEEP REDUCTION
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3-A-92	.74	1.00	2.09
3-B-92	.84	1.00	1.24
3-C-92	.75	1.00	2.64
3-D-92	.75	1.00	1.24
3-E-92	.84	1.00	2.09
3-F-92	.84	1.00	2.64
3-G-92	1.00	1.327	2.09
3-H-92	1.00	1.327	2.64

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*Specify the MODEL*

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## CALENDAR

OF COMING EVENTS

1961

**April 12-14, 1961**—American Institute of Mining, Metallurgical & Petroleum Engineers, International Symposium on Agglomeration, Sheraton Hotel, Philadelphia, Pa.

**April 13-14, 1961**—American Mining Congress, Colorado School of Mines Research Foundation, Inc., Conference on Radioisotopes in Mining Industry, Brown Palace Hotel, Denver, Colorado

**April 18-20, 1961**—American Institute of Electrical Engineers, Cement Industry Technical Conference, The Sheraton-Cadillac, Detroit, Mich.

**April 24-25, 1961**—American Institute of Mining & Metallurgical Engineers, Southwest Minerals Conference and National Meeting of the Industrial Minerals Section of the Society of Mining Engineers of AIME, Stardust Hotel, Las Vegas, Nevada

**April 27-28, 1961**—National Slag Association, Plant Operators Committee Meeting, Sheraton-Cleveland Hotel, Cleveland, Ohio

**April 27-29, 1961**—Texas Aggregates Association and Texas Ready Mixed Concrete Association, 7th Joint Annual Convention & Equipment Show, Robert Driscoll Hotel, Corpus Christi, Texas

**May 11-13, 1961**—National Lime Association, Annual Convention, Grand Hotel, Point Clear, Ala.

**June 12-13, 1961**—National Limestone Institute, Mid-year Board and Committee Meetings, Sheraton-Blackstone Hotel, Chicago, Ill.

**June 25-30, 1961**—American Society for Testing Materials, 64th Annual Meeting, Chalfonte Haddon Hall, Atlantic City, New Jersey.

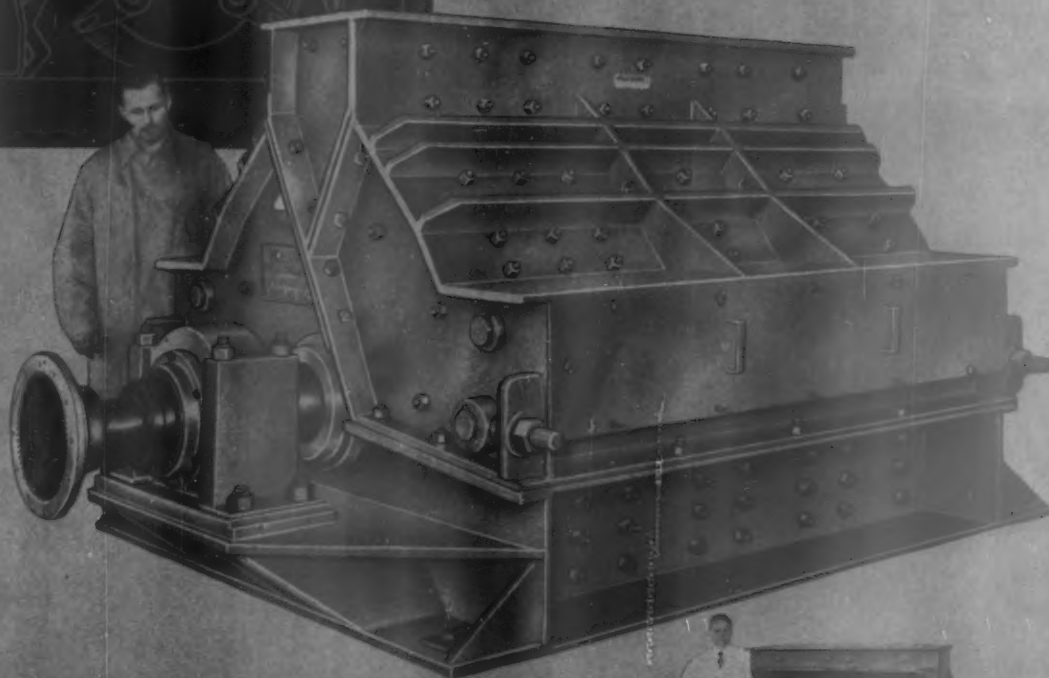
**July 13-14, 1961**—National Crushed Stone Association, Mid-year Meeting, Board of Directors, The Greenbrier, White Sulphur Springs, W. Va.

**August 20-24, 1961**—Semi-annual meeting, Board of Directors, National Sand and Gravel Association, The Greenbrier, White Sulphur Springs, W. Va.

**September 10-13, 1961**—American Mining Congress, Metal Mining & Industrial Minerals Convention, Seattle, Wash.

**October 5-6, 1961**—National Lime Association, Operating Meeting, Shoreham Hotel, Washington, D.C.

# **WILLIAMS REVERSIBLE IMPACTOR**



- 100% Impact Reduction
- No Friction Or Abrasion
- Unobstructed Discharge
- Less Upkeep Expense



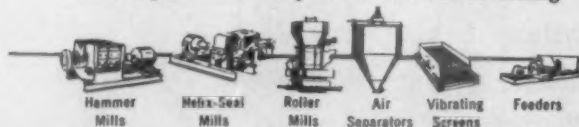
Internal view showing manganese steel impact blocks, hammers and liners. Rugged, heavy steel plate construction. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.

## **Unequalled For Secondary Grinding**

Reduces limestone and material of similar hardness to  $1\frac{1}{2}$ ",  $\frac{3}{4}$ " or smaller. Properly adjusted, the Williams Impactor makes excellent material with the proper percentage of fines for road base course. Unusually low upkeep expense as reduction is 100% by impact. Material is fed to enter between the hammers and is thrown against the impact blocks setting up a repeated ricochet action which accomplishes the reduction. Adjustable impact blocks adjust for wear. A reversing

switch on motor permits rotating hammers in either direction, to the left today and to the right tomorrow, thereby giving double hammer life. No grates are used. Entire bottom is open permitting unobstructed discharge of crushed material and less wear and tear. A size for every job. Let us tell you about one for your use.

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# **WILLIAMS**

**CRUSHERS GRINDERS SHREDDERS**

Oldest and Largest Manufacturers of Hammer Mills in the World

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ROCK PRODUCTS, April, 1961



# ideas and news:



**Latest step in mill trunnion drive evolution:** New Twinducer drive divides mill load electrically, between twin synchronous motors. Compared to trunnion drives with mechanically divided load, the Twinducer drive requires 50% less space. Since there are no floating gears or pinions, gear wear is kept to a minimum. Twinducer drive fits any plans for automatic grinding operation.



**For quality control . . . lower processing costs:** Systemation engineers help you benefit from the degree and type of automatic operation most suited to your needs. Allis-Chalmers will undertake responsibility for the design of complete operating facilities. Systemation service is based on a thorough understanding of your processing requirements, gained from years as a process designer and major equipment supplier to your industry. Added is the experience of over 500 successful advanced electronic control systems by Consolidated Systems Corporation, an affiliate company.

## Which of these productive ideas could be working for you?

A pump that defies wear. A high-voltage motor control center. These examples demonstrate the extra value that is standard with Allis-Chalmers...the greater efficiency and the added productivity which are yours when you buy A-C products, systems and services. Call your Allis-Chalmers representative for details on A-C "worth-more" features. Or write Allis-Chalmers, Industrial Equipment Division, 905 S. 70th Street, Milwaukee 1, Wisconsin.



◀ **420,000 tons of sand pumped . . . no major repairs:** This A-C rubber-lined pump, in service almost five years, pumps rod mill discharge to sand screws for classification. It replaced an alloy metal pump which failed after pumping 10,000 tons. The alloy pump replaced a standard metal pump which failed after 4,000 tons. Only \$840 or about 2 mills per ton has been spent for repairs.

**High output — low installation costs:** One of the world's largest aggregate-handling screens met the needs of an aggregate producer for higher output and minimum installation costs. This 7 by 20-ft Ripl-Flo screen handles 600 tons per hour and is mounted on foundations previously used for a 5-ft screen.



◀ **So low, two fit where one used to go:** This new SpaceMaker control center is the first completely new 2- to 5-kv motor controller development in more than a decade. Two-high design can cut floor space needs in half. Full drawout construction makes it the safest, most easily accessible controller available. Flame-retardant, track-resistant Super Pyro-Shield insulation adds reliability. Walk-in Shelter-Clad enclosures available for outdoors.

**A-C INDUSTRIAL EQUIPMENT DIVISION:** motors, generators, controls, rectifiers, pumps, compressors, crushers, mills, screens, kilns, coolers, industrial systems.

**OTHER A-C PRODUCTS:** thermal, hydro and atomic electrical generating equipment; switchgear, transformers, unit substations; tractors, earth-moving equipment, engines, lift trucks.

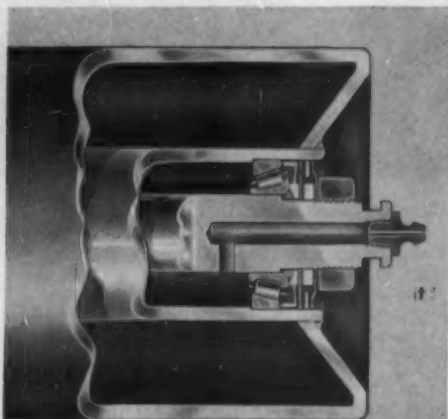
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# HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN



## Bottom-dump barges tote gravel for producer

An eastern sand and gravel producer who works river deposits has developed a rather ingenious technique to get his products to shore and on their way to his washing plant.

Dredging equipment loads river gravel directly into a 100-ton, bottom-dumping barge. This unit is towed to a shallower part of the river where an earth fill haul

road lets this producer's trucks get way out into the river. Then the barge dumps its load into the water at the very end of the roadway and returns to the site of the dredging operations.

While it is gone, a dragline stationed at a turnaround at the end of the roadway, reclaims the sand and gravel from the river and loads the waiting trucks.

## What's the best pipe bending practice?

When bending large pipes, it is important to pack as much sand into the pipe as can be put in practically, and there is no better way than the vibration method. But there is one best method, even with the use of vibration.

Originally, it was thought that the best way was to stand the sealed lower end of a pipe on a vibrated platform. The method worked, but it was found that the results were not always entirely satisfactory. The operators found that more sand could

still be packed into the pipe by hammering its sides.

Various methods were then tried and it finally developed that the most satisfactory method is to attach a vibrator to the side of the pipe with a chain clamp. The pipe stands in a vertical position with the lower end sealed just as before.

After the pipe is filled and vibrated until it will not hold any more sand by that process, additional sand can still be forced into the pipe by pounding it with a sledge hammer.

In other words, the best way is to use the mechanical vibration method to accomplish the hardest part and most of the work, and then finish the job with 20 to 50 blows from a hammer to bring about the final settlement. Use that method and you surely will be well pleased with the improved shape of the pipe after bending.

W. F. Schaphorst, Newark, N.J.

## Rock breaking with a tractor shovel

A number of crushed stone producers with Drott buckets on their tractor shovels have discovered a use that the manufacturer probably never anticipated for them—secondary breaking.

One large rock is selected as an "anvil" while the machine grabs another piece of oversize in the hydraulically operated bucket. Moving into position above the anvil, the machine lifts the oversize block of rock high above the ground before it releases the jaws of the bucket. Then the rock weighing several tons drops to the anvil with a resounding crash and breaks into a number of smaller pieces.

When enough material has been reduced to crusher-sized rubble, the machine loads it all into a truck. Then the operator is free to fish another supply of big blocks out of the pile of blasted rock and repeat the process.

(Continued on page 72)

## HINTS & HELPS

(Continued from page 71)

### Ingenious stockpile layout

A southern lime producer has a stockpile that holds more than a month's supply of rock at normal production rates. However, it supplies a kiln that operates 24 hr. a day.

Under these conditions, an elaborate stocking out conveyor system is not necessary, yet it

has to be big enough to move a lot of material from a train of cars to storage. A reclaim system only needs to work once a day, enough to keep the kiln's storage tank full of limestone.

Most economical solution to the problem proved to be an overhead, reversible conveyor. It takes material from a bucket elevator at the left by the rail hopper, and builds a storage pile. When reclaiming, it operates in the opposite direction. Then it is

supplied with material from a bucket elevator (center) that receives stone from a reclaim con-



veyor system. The conveyor is cantilevered out from both sides of a structural steel tower. In this way, the supporting structure is kept out of the center of the pile.

## Screen Story...



Here's a shot of an Overstrom 4' x 12' Vibrating Screen — the newest of three similar units sizing crushed product for Construction Aggregates, Ltd.'s, big, modern facility on the shores of Howe Sound at Britannia Beach, about thirty miles north of Vancouver.

From California to Texas, from South America to Canada, you'll find Overstrom Vibrating Screens getting the same endorsement — "a tough-and-ready performer under all types of operating conditions."

"Big O" Screens have everything you'd expect in *quality* screening equipment. For example — vibrator heads are unitized, easy-to-change, sealed cartridges. (Factory rebuilt exchanges are kept in stock.) Husky spiral suspension springs are designed to give maximum vibration isolation with high lateral stability. Heavy-duty bearings run in oil — *longer life, less maintenance.*

(write for catalog and pictorial case histories)

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### Hopper car heaters

An eastern steel mill has developed a new technique for unloading cars of frozen coal, limestone, dolomite and sand. Gas-operated infrared heaters are installed between the rails of a track hopper and these quickly melt the frozen material in the bottom of the car hoppers. Additional heaters at the sides supplement the effects of the bottom heaters. Apparently the infrared equipment is quicker and more economical than older oil-fired torches that sometimes damaged the steel cars.

### Ancient truck keeps working

Even though the White truck of World War I vintage will never haul any more rock from the quarry, it is still working to earn its keep. A Missouri crushed stone producer finds that the vintage vehicle attracts lots of attention in spite of its hard tires and battered appearance. And, who knows, maybe it sells more agricultural limestone for him than an expensive billboard with neon lights?

(Continued on page 75)

# REO



## REO TANDEMS... the talk of the transit mix business

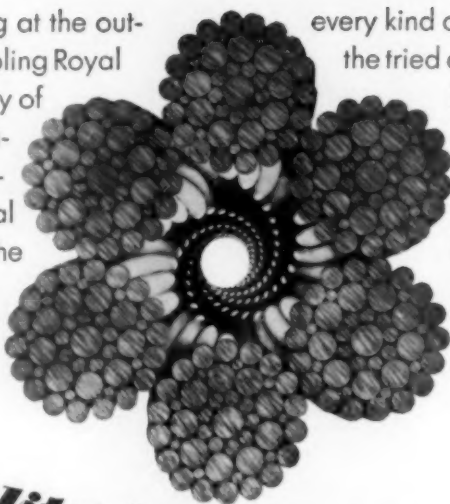
Word gets around fast. Reo's rear axles can haul more payload—legally—because of lower rear chassis weight and unique front axle placement. You get another 400 to 600 lbs. of payload capacity with Reo's low cost, *flywheel power take-off*—installed as an integral part of the chassis engine drive. But that's not all. Reo's *Gold Comet* engine goes the life of the truck without cylinder re-boring or block replacement—thanks to exclusive "wet sleeve" construction. *ReoMatic transmission*—fully proved, fully automatic—helps speed delivery schedules by eliminating power interruption and gear shift guesswork; prevents harmful engine lugging, too, and minimizes the chance of drive line damage. Better get the complete Reo story before you buy.

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every kind of job, there is no substitute for the tried and proven quality of Roebling Royal Blue. It pays off for you. Learn more about Royal Blue from your wire rope distributor, or write now for free booklet to Roebling's Wire Rope Division, Trenton 2, N.J.

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*We put a lot of work into it—  
You get a lot of work out of it*

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## HINTS & HELPS

(Continued from page 72)

### Conveyor safety again

Workers should be careful about getting caught in conveying machinery, and most workers are careful. But nevertheless, despite their care, accidents are continually occurring. For example, in one plant a common accident was to get hands caught between the moving conveyor belt and the head pulley. The seriousness of the injury would depend largely on the weight of the load on the conveyor belt that increased the tension in the belt.

Accidents were reduced by simply placing a wooden block or a steel plate in front of the pulley to prevent a hand from getting in between it and the conveyor belt. The safety idea was worked out by the operators of the conveyor in cooperation with the designers.

W. F. Schaphorst, Newark, N.J.

### Lever-operated switches

Small, compact lever-operated switches find a number of useful applications around almost any rock products plant. For example, a cement plant has equipped a gate in a catwalk with one that is interlocked with an overhead crane drive. When the gate is open, the crane cannot move. When the gate is closed and the switch contacts release the crane's magnetic switch, it can be operated.

A midwestern crushed stone producer has several dozen lined up along the conveyor above his storage bins. These switches signal the operator at his panel just where the traveling belt tripper is at any particular time. When he wants to change it from one bin to another, he can tell when the tripper has reached its new location without taking a long walk to top of bunkers.

END



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ROCK PRODUCTS, April, 1961

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AXLE</sup> TRUCKS**  
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**GREATER DURABILITY...**  
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- New stronger frames and huskier cabs!

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50,000 miles, sliding percentage scale thereafter.

In addition, an extended warranty covers all 1961 Ford Trucks of any size. Each part, except tires and tubes, is now warranted by your dealer against defects in material or workmanship for 12 months or 12,000 miles, whichever comes first. The warranty does not apply, of course, to normal maintenance service or to the replacement as normal maintenance of such items as filters, spark plugs and ignition points. No other truck gives you such protection for your investment; never before could you be so confident of long-range durability!



**Tougher tandems** offer greater strength in chassis, cab and sheet metal for longer life. Full-Torque fly-wheel power take-off is available for more efficient drive of transit mixers and heavy-duty equipment.



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**GVW's up to 51,000 pounds** permit big, profitable payloads. Heavier gauge metal and stress-isolating independent mounting for radiator, fenders and cab give you greater durability.



**Tilt Cab models** are available with tandem rear axles. As with conventional tandems, aluminum walking beams, wheels and fuel tanks are offered to cut weight, boost payload.

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ROCK PRODUCTS, April, 1961

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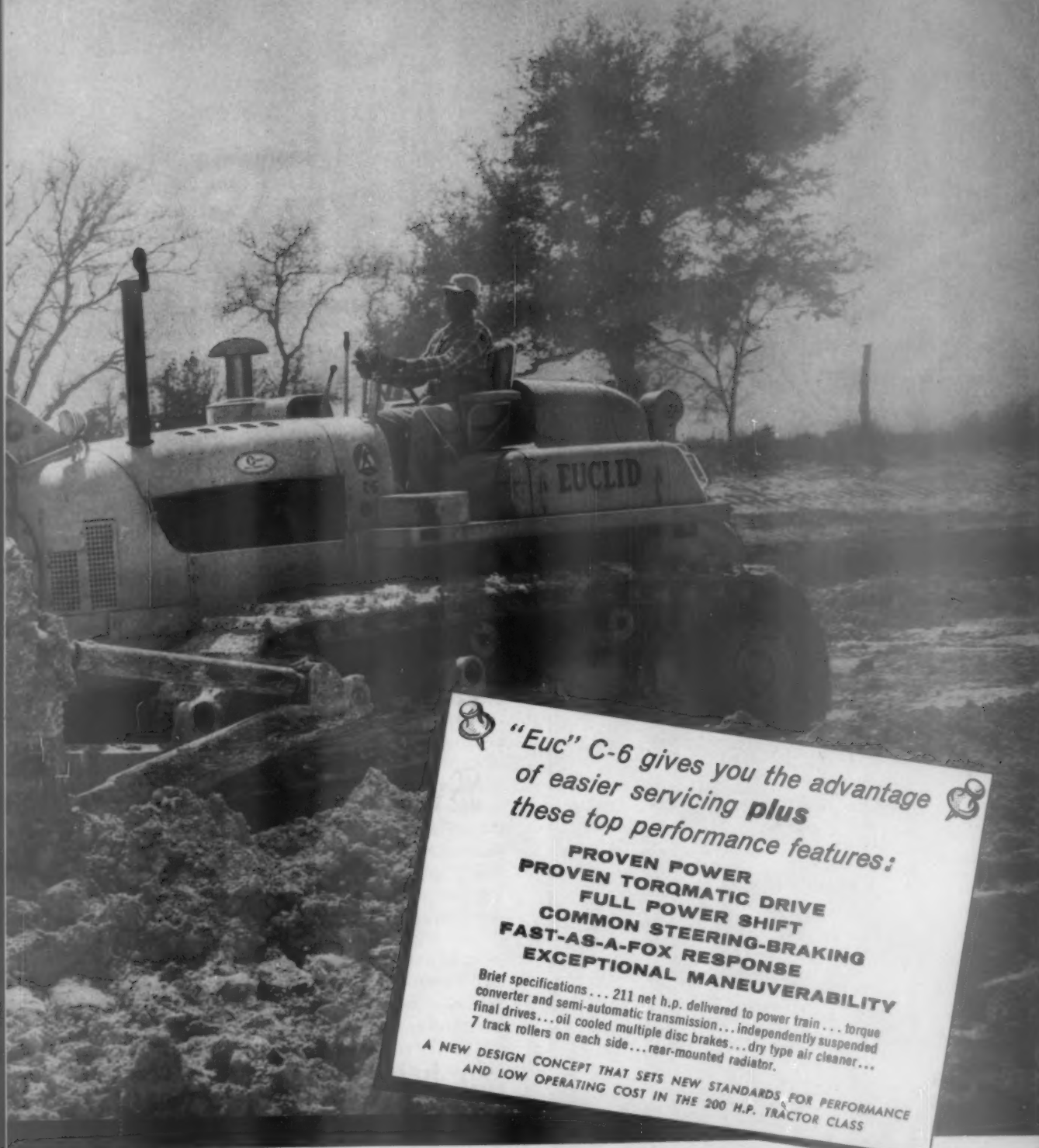
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*Full-power shift...this Euclid C-6  
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Will  
Congress  
re\$olve  
money trouble\$  
on the  
inter\$state  
\$y\$tem?

by Joseph N. Bell

Left: Rex M. Whitton

## *Vital highway network loses steam as Congressional committees and executive departments clash on financial philosophy*

**A**T THIS PRESS CONFERENCE on February 16, President Kennedy said: "I want to see the economy get on its feet and the people back to work." As an immediate step in this direction, he ordered an additional \$734 million in federal funds made available for allocation to the states for highway construction. In this climate of expanding federal pump-priming, it is easy to assume that the massive \$40-billion interstate highway program will emerge from the financial doldrums in which it has been languishing and pick up some of the momentum of its beginnings a few years back.

Such a conclusion is too easy, too pat. Superficially, everything seems to indicate a quick resumption of stepped-up building on the interstate system. The Administration will be pushing public works hard and the Congress is generally agreed on the desirability of the roads. What then could possibly get in the way?

The arguments, of course, will not revolve around the results to be attained but on the means of attaining them. Here, there is profound disagreement. It may turn out to be quite difficult to resolve, yet there must be a resolution very soon. The program is in deep financial trouble, and the temporary tax expedients used to bail it out will not suffice much longer. Although the interstate program will continue to operate if this Congress fails to act at all on new highway financing, it will certainly be sluggish and dispirited—a far cry from the lusty, booming building program envisaged by the Kennedy Administration.

The interstate system's present financial woes can be distilled down to rather simple terms. The highway program has been going broke because the total cost—assembled in a ridiculous hurry by the Bureau of Public Roads under severe Congressional pressure—was underestimated by some \$11 billion. The entire financing mechanism was based on this figure that almost every responsible official involved knew at the time was superficial and unquestionably too low.

The program has not gone broke because the original financing system was faulty. And there is an increased tendency to blame the financial superstructure for the interstate system's present money problems rather than the faulty base on which it was erected. This method would have

worked had it been based on a realistic original estimate of the cost of the program. Now that such cost estimates have been made, the entire financing program will have to be reconstructed.

However, this battle will probably have to be fought out in Congressional hearings and committees all over again. And while that goes on, the highway program will slog sluggishly ahead.

All of this Congressional bickering is, unhappily, of very basic interest to the rock products producers of North America. The mirage of burgeoning markets generated by construction on the interstate highway system has been a illusory and capricious charmer for aggregates producers.

*Please turn page*

**EDITOR'S NOTE:** *The single most important, immediate factor maintaining a high prosperity quotient of the rock industries is the Interstate Highway Program. Recognizing this, ROCK PRODUCTS recently sent Special Features Editor Joseph N. Bell to the nation's capitol to interview the people who must resolve the multiple problems of the floundering highway program.*

*The results of Bell's detailed research and interviews will be published in a four-part series entitled "Highway Report, 1961." The first installment discusses the program's financial straits and features an exclusive interview with Rex M. Whitton, the new federal highway administrator. The three installments to follow will deal with the following:*

- *The BPR fact-finding studies—What do they say and what do they mean?*
- *The highway scandal—How deep does it reach?*
- *Where does the interstate highway program stand today?*

*These articles will be up-to-the-minute and pertinent to the planning and marketing problems of rock products producers during 1961. They are offered in a continuing effort to provide the readers of ROCK PRODUCTS with articles of genuine service to them in operating a successful business.*

**Meet Rex M. Whitton,  
new federal highway administrator**



*There are new hands on the reins of the Federal Highway Program. They belong to a mild-mannered, almost diffident but tremendously competent veteran highway engineer named Rex M. Whitton. Mr. Whitton, chief engineer of the Missouri State Highway Commission, was appointed Federal Highway Administrator by President Kennedy late in 1960. He took office officially just two days before ROCK PRODUCTS was granted an exclusive interview with him.*

*Mr. Whitton was born in Missouri and joined the state highway department in 1920 at the age of 22. This occurred immediately after his graduation from the University of Missouri, where he received a degree in civil engineering. For the succeeding 30 years, he served effectively in almost every administrative capacity in the Missouri highway department. He was named chief engineer in 1951 and served in that job until he was appointed to the top highway post in the nation.*

*His stature in the highway field is unquestioned. The list of his honors are almost as long as the miles of highway he has built. Here are a few of the more outstanding:*

- Past chairman of the Executive Committee of the Highway Research Board
- The George S. Bartlett Award in 1958 for outstanding service in highway progress
- The American Public Works Association 1960 selection as one of the "Top Ten Public Works Men of the Year"
- 1960 recipient of the Thomas H. MacDonald Award for continuous outstanding service in the highway engineering field
- President of the American Association of State Highway Officials in 1956

*Mr. Whitton's is probably one of the most popular appointments made by the new Administration. Highway builders all over the nation who have long respected Mr. Whitton's capabilities applauded his selection, just as they had that of Bertram D. Tallamy (former chief highway engineer of the state of New York) who served so competently as Federal Highway Administrator in the Eisenhower Administration.*

*It will be some months, of course, before any legitimate assessment can be made of Mr. Whitton's administration of the Federal Highway Program. But the prospects are good. He brings unquestioned technical and administrative competence to the job. He sounds as if he means it when he says, "We want to get on with the job."*

**WILL CONGRESS RESOLVE . . .**

*continued from page 81*

Like Lorelei in Teutonic legend, the interstate program never quite lived up to her promises. Prospects of rich, profitable business have always been alluring and close to fulfillment; legions of producer-admirers have continued to hang around hopefully waiting for the fickle lady's largess.

Now her teasing has caught up with this lady of tantalizing promises. The siren is in desperate financial straits. She must put up or shut up—even though many of her proponents still loudly insist that she will yet produce on all of her lavish promises of the past five years. This is not a sure thing by any means.

The reasons for the doubt are all economic. Practically no responsible public official denies the need for the roads or the desirability of the interstate system. The problem is, has been and will continue to be: "How to pay for it."

## Here's a transcript

**Bell:** When do you hope to complete the interstate highway system?

**Whitton:** We'd like to finish it at the earliest practical date. It all depends on the financing. We'll move just as fast as we're permitted to move by the funds available.

**Q.** Do you expect to eliminate all of the graft that is presently giving the highway program a black eye in some areas?

**A.** The interstate program is large. It's difficult in a program of this size to avoid hiring a few people whose moral standards are considerably less than what we want. All we can do is set up checks that make it very difficult for them, and this we are doing. We've had such safeguards in Missouri for many years, and they work.

**Q.** Has the highway scandal been overstated in the press?

**A.** I think it has been overstated in some segments of the press. There isn't a high percentage of stealing going on in the highway program and never has been. The irregularities that have been turned up have been magnified far beyond their

Later in this four-part series, we will examine in some detail the various methods put forth to finance the federal highway program. It suffices to say, at this point, that the contending factions break down basically into two camps:

1. The Boggs (Congressman Hale Boggs, D-La.) faction in the House of Representatives. This group conceived the original sliding scale financing plan that would have required a brief period of deficit financing in the midst of the program. Rep. Boggs believes firmly that, left alone, this system would have worked. His group is likely to put forward a similar financing proposal in the present Congress.

2. The Byrd "Pay-As-You-Go" contingent in the Senate. These men stand four-square against any sort of deficit financing and were able to im-

pose their will on the original House highway financing program.

As a result, what emerged in the original interstate financing program was an amalgam of two rather widely divergent points of view. These two viewpoints exist even more strongly than before. Sen. Byrd still sees himself as the watchdog of the sound dollar, and Rep. Boggs still believes his sliding scale method will work if based on a realistic cost of the complete program. Reconciling these two crystallized points of view is not going to be easy, even though both groups are sold on the urgency of the highway program.

Another sizeable stumbling block must be surmounted. Responsibility for actually hammering out a workable dollars-and-cents system of financing the interstate program must be fixed in adding

*Please turn to page 142*

## of some of the most important parts of the interview

part in the total picture. Yet those disclosures have also performed a considerable service because they will certainly help us eliminate any dishonest practices that still exist.

**Q. Has the glamour and the publicity given the interstate highway program and the emphasis on these highways tended to downgrade the rest of the federal-aid system?**

**A.** No, not at all. As a matter of fact it has had quite the opposite effect. The interstate program has helped the rest of the federal-aid system. Prior to the interstate program, individual states were required to put up half the money needed to build or improve federal-aid highways. Under the interstate system, of course, the states must put up only 10 percent of the money. This has freed considerable state funds for use in the 50-50 program and, as a consequence, the entire federal system has benefited and will—I'm sure—continue to benefit.

**Q. Our readers are the people who will supply much of the materials needed to build the interstate system. For their information and guidance, would you outline the cornerstones of your administration of the federal highway program?**

**A.** At the moment—and this is very early in the game, you understand—we will be following six primary guideposts:

1. We will make every effort to speed up the interstate program. As I said before, this is controlled by the amount of money available to us, but we intend to move just as fast as we possibly can within the funds provided.

2. We will also implement a specific program of encouragement to the states to move more quickly in making the necessary appropriations and plans for federal-aid highways.

3. In cooperation with the states, we will set up whatever checks are necessary in eliminating fraud in the highway program.

4. We plan to continue the historic and successful partnership between the individual states and the Bureau of Public Roads. We do not intend to encroach in any way on the prerogatives of the states.

5. We will encourage a balanced program of highways in each state.

6. We will encourage research in highway work to the end that our methods and results may be improved as conditions dictate.



*Alabama metal producer wrests space-age magnesium  
from boundless supply of low-grade dolomites*

## Alamet distills limestone to yield magnesium

by Elwood Meschter

**D**OLOMITIC LIMESTONE IS A COMMON ORE of the exotic lightweight metal, magnesium. Few rock products producers realize this fact as they go about their daily chores of making salable aggregates from their particular rock formation. Nor would it do them much good to know, since the metal is locked in tight chemical combination with oxygen and carbon. Of course, this very chemical tenacity makes most dolomitic limestones such hard and durable aggregates. It is the basic reason why these carbonate rocks cannot be processed for their metals in the same way as the carbonate ores of other less valuable metals.

A practical, economic method of wresting the valuable lightweight metal from limestones and low grade dolomites had to wait until the national emergency of World War II. Then the relatively rare and costly magnesium became a critical metal. Worthwhile volumes were produced only from a couple of huge, costly brine processing plants located on the vulnerable seacoasts or near brine wells. This is an electrolytic process that consumes great amounts of electric energy—energy that could hardly be spared during wartimes.

The dramatic breakthrough that unlocked magnesium metal from dolomitic limestones was the Pidgeon process (U. S. patents 2,330,142 and 2,330,143). In this process, finely ground dolomitic lime is reacted with ferrosilicon in a sealed retort under high vacuum at temperatures around 2,100 deg. F. As the metal is formed, it boils off and is condensed in the cold end of the steel vacuum tube, forming a cylindrical slug of magnesium.

Small magnesium plants are now economical. They can be scattered around the country, close to local supplies of rock but away from strategic production centers. Natural gas supplies the primary fuel instead of large electric generating stations, with their costly, vulnerable, high-voltage distribution systems. Small amounts of exceedingly pure magnesium can be produced with relatively modest amounts of labor and energy. Ferrosilicon and fluorspar, the other ingredients in the process, are readily available.

But for all its advantages, the Pidgeon process never displaced the seawater processing plant. The cost of even a plant of moderate size is high; about \$5 million is the tag to produce approximately 6,000 tons of primary magnesium a year. Marketing it is another major problem. Once the wartime production crisis passed, postwar production dipped to a low of around 6,000 tons and has since surged as high as 80,000 tons a year.

Still, magnesium production might represent an attractive area of investment and diversification for a rock products producer. Quarrying, rock processing and lime burning—basic steps in the Pidgeon process—are familiar to many producers. Only vacuum furnace operation would be completely strange. But this is a technology that is thoroughly understood by very few practitioners even today. The market for magnesium will almost certainly lose its volatility and settle down to a pattern of steady growth as it becomes an accepted structural metal and finds wider use in industry.

Alabama Metallurgical Corp. took the plunge into extracting magnesium from dolomitic limestone by building a plant at Selma, Ala. Local labor and natural gas are plentiful and economic.

*Please turn page*

**Left:** Workers get ready to remove slag after the crackling, sparkling red-hot slug of magnesium has been pulled from a retort

## ALAMET DISTILLS LIMESTONE . . .

*continued from page 85*

Dolomitic limestone supplies in Alabama are virtually inexhaustible. Primary industrial markets for magnesium are closer to the Alamet's plant in this relatively isolated location than to most competing producers of the light metal.

Rock requirements of the new plant are supplied by Alamet's quarry at Montevallo, 50 miles north of Selma. Here, 20 to 30 rail cars a week of 1 x 1/2-in. rock are processed to build the plant's raw material storage pile. Magnesium carbonate content of the limestone averages between 18 and 20 percent.

Limestone is put into an outdoor storage pile through a track hopper centrifugal discharge bucket elevator and overhead reversible belt conveyor. Alternatively, the elevator can put rock right into the kiln storage tank. The 50-ft. deep conical pile holds about 8,400 tons of rock above a concrete reclaim tunnel. Blending and mixing of limestone is achieved by drawing off material from the stockpile through nine reclaim gates to a reclaim belt conveyor. This conveyor discharges to a continuous bucket elevator that lifts stone back to the reversible conveyor. Now reversing its direction, the conveyor takes stone to a 500-ton steel storage bin.

This circular tank holds limestone ahead of the kiln, and the bottom is fitted with a rotary table feeder to withdraw kiln feed material. The amount of rock plowed off the slowly rotating plate can be changed to regulate the rate of kiln feed, up to about 15 tph. A belt conveyor under the feeder dis-

charges limestone to the boot of an elevator that lifts stone to the feed end of the rotary lime kiln.

Natural gas fires this 8 1/2 x 170-ft. kiln. Elaborate controls are not needed, since the process merely requires the limestone to be thoroughly and completely reduced to oxides. Discharge end of the kiln is fitted with eight cooler pods and, in this way, the lime is cooled close to ambient temperature as it gives up heat to the secondary combustion air. Further production flexibility is achieved with a four-speed drive on the kiln so that its speed can be selected to match the feed rate of the raw rock coming into the kiln.

**Burned dolomitic limestone**—now called calcine—is discharged from the cooler pods and collected in a screw conveyor. Then it is elevated to the top of a steel storage tank where it is held until needed by a 5-ft. diam. air-swept single whizzer roller mill. The stream of air through the mill lifts fine lime to an overhead separator, where it is dropped out of the air stream and collected in a steel storage tank. The air circuit is vented to a dust collector that prevents any lime dust from escaping.

In the meantime, the two minor but very essential elements are prepared for mixing with the fine lime. Ferrosilicon is now purchased in crude lump form and then reduced to minus 200-mesh. This is accomplished in a crushing and ball mill circuit, and the acceptable fines are elevated to one compartment of a three-compartment batching bin. Fluorspar is used in such small amounts

Alamet's new plant at Selma, Ala., has plenty of labor and natural gas, as well as inexhaustible supplies of dolomitic limestone

A stockpile of 8,400 tons of 1 x 1/2-in. rock will let the big lime kiln operate several months at top capacity



Right: Magnesium metal is extracted from dolomitic limestone by the Pidgeon process arranged in this way

that it is most economically purchased already ground. These additives are processed relatively infrequently, since taken together they make up less than 20 percent of the weight of mix going to the vacuum furnaces.

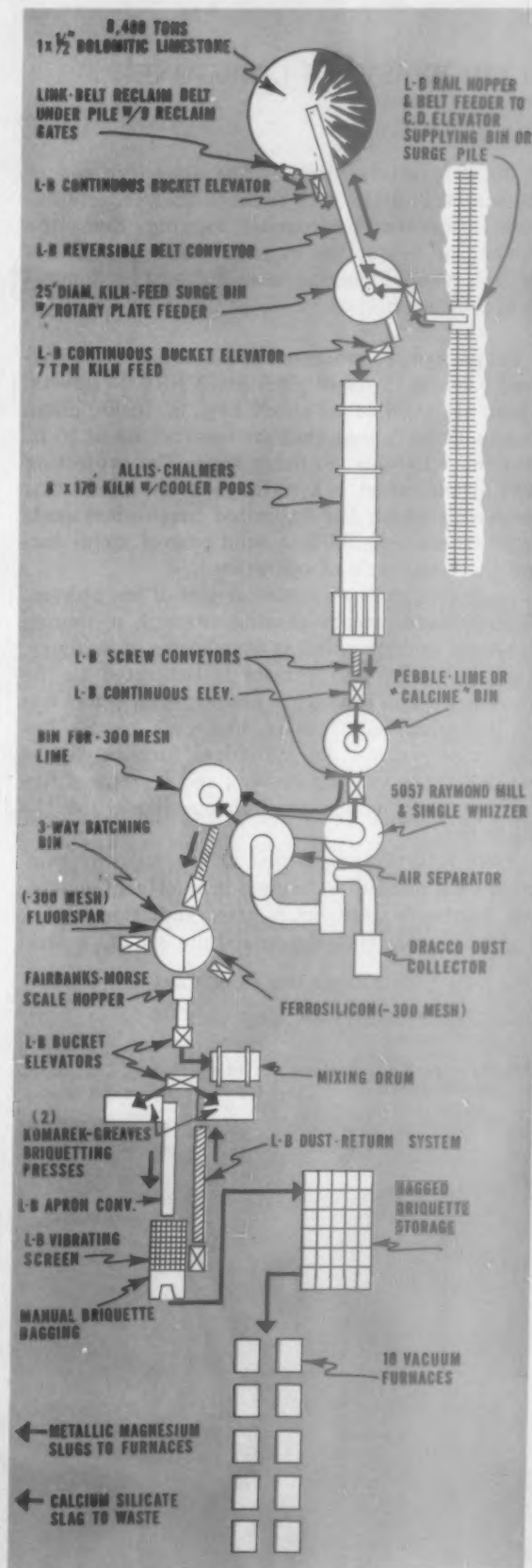
The three-compartment batching bin is the first unit in the system that makes briquettes of the raw materials to feed the vacuum furnaces. Each segment of the bin tapers to a hopper bottom that is equipped with a vibrating feeder. Each feeder is operated in sequence long enough to automatically dole out enough of each material to make up a batch of about 3,200 lb. into a scale hopper. An air-operated rotary valve drops the fine materials into a surge hopper with a screw conveyor in the bottom. Once each batch is in this hopper and on its way to a mixing drum, the operator can start the sequence of measuring out another batch.

Each batch of lime, ferrosilicon and fluorspar is thoroughly mixed in a mixing drum before it is then discharged to a screw conveyor leading to the bucket elevator serving the two briquetting presses. The discharge spout of the elevator is belled out to serve as surge storage above the press. While only one press can keep up with normal operation of the vacuum furnaces, both presses are occasionally put on the line to accumulate an inventory of briquettes in anticipation of greater than normal production.

Finger-size briquettes drop out of the presses to an apron conveyor for the trip to a dedusting screen. This screen takes out minus  $\frac{1}{4}$ -in. fines and drops them to a screw conveyor to be returned

*Please turn page*

Quality control is activated with a battery of X-ray analytical instruments. A laboratory worker puts specimens into an emission spectrograph



## ALAMET DISTILLS LIMESTONE . . .

*continued from page 87*

to the briquetting presses. The discharge end of the screen is fitted with a chute that collects finished briquettes for manual bagging. Since the number of briquettes in each paper bag is not critical, manual bagging is as fast and economical as any other method.

**Briquettes are processed to metal** in 1 of 10 gas-fired vacuum furnaces, each fitted with 24 retorts. These are steel tubes about 10½ in. inside diam. and about 10 ft. long that are inserted about 10 ft. into the 2,150-deg. F. firing zone. The projecting part of the retort is a water-jacketed condensing section in which the vaporized magnesium cools and hardens to build up a solid plug of metal during the 8-hr. cycle of operation.

High vacuum is an essential part of the process. High-pressure steam passing through a venturi produces vacuum rated at 50 microns of mercury. Each group of four retorts is connected to the vacuum system through a header; each retort has its individual cutoff valve, and each header has two cutoff valves. An individual furnace can be cut out of the vacuum system, and a group of five furnaces can be operated independently of the other five.

Four retorts are charged at one time by ramming each one full of bagged briquettes. Condensing hardware includes a steel radiation shield, a steel shield to condense sodium vapor, a steel

sleeve to hold the slug of magnesium and a steel plate to seal the end of the retort.

Once the retorts are filled and the end plates secured, the vacuum line valves are opened to start the process. At the end of the turn, the procedure is reversed. The plates are removed, the slug of white-hot magnesium is extracted with tongs, and the shields pulled out. Long-handled shovels scoop out the glowing briquettes that have now been converted to a complex iron-calcium silicate, then placed into tote boxes for the trip to a disposal area.

**Magnesium slugs are taken** to a metal processing setup where a ram press pushes the metal out of the sleeve. The steel sleeve is returned to the furnace area where it, along with other hardware, is cleaned and inspected before it is again used in the retorts. Metal slugs are melted down in semi-refining furnaces and cast into ingots ready for shipment.

**Quality control** assures that impurities in the magnesium are held within a few parts per million. And Alamet has the laboratory tools to maintain watch on its production. Two spectrographs indicate the presence and concentration of impurities in the magnesium. One instrument is a quantograph that provides high-speed qualitative and quantitative analysis by a photographic record of spectra. The other is a 1.5 meter production control quantometer that gives a permanent, instantaneous strip-chart recording of the concentration of impurities in parts per million. Measurements are made on regular and frequent samples from each heat of refined magnesium. Raw material analysis is done by the slower but less costly wet analytical techniques.

END

Results of an X-ray analysis are interpreted on a densitometer



### MAJOR EQUIPMENT REFERENCE

Bucket elevators, (11)		
Belt conveyors, (4)		
Screw conveyors, (4)		Link-Belt Co.
Apron conveyors, (2)		
Rotary table feeder		
Vibrating screen		
Mill and air separator	Raymond Div., Combustion Engr., Inc.	
Dust collector		Dracco Div.
Kiln, 8½ x 170-ft.		Allis-Chalmers Mfg. Co.
Vibrating feeders, (3)		Syntron Co.
Weighing scale		Fairbanks-Morse Co.
Pellet presses, (2)		Komarek-Greaves Co.
Quantograph		Applied Research Laboratories
Quantometer		
Steam generators, (2)		Superior Boiler Mfg. Co.
Ingot mold conveyor		Link-Belt Co.
Ingot mold conveyor		Jeffrey Mfg. Co.
Deep well pumps, (5)		Ingersoll-Rand Co.
Consulting engineer		Walter B. Couse

*Limestone producer's simple circuits  
meet smelter's specifications*

## Aggregate plant readies magnesium ore

by Elwood Meschter

**D**OLOMITIC LIMESTONE IS THE ORE for Alabama Metallurgical Corp.'s magnesium plant at Selma. The new plant's stone requirements are supplied by Montevallo Limestone Co. from its quarry 50 miles north of Selma. This quarry ships the 20 to 30 rail cars a week to maintain an 8,400-ton stockpile of 1 x 1/2-in. limestone at the plant.

A new part of the quarry has recently been opened especially to supply Alamet's needs so that no definite operation pattern has been established. The vacuum furnaces at Selma need stone with about 18 to 20 percent magnesium carbonate. The quarry operators recognize the bands of high-calcium limestone and discard this material in favor of the dolomitic stone.

Rock preparation at Montevallo is simple. Trucks haul limestone the 1,000 feet from quarry to primary crusher building. The primary jaw crusher handles about 200 tons per hour of stone, reducing it to minus 1 inch. Belt conveyors carry the

crushed rock to the top of a 5 x 14-foot three-deck vibrating screen.

Oversize rock from the top deck is dropped to a large cone crusher and recycled to the top of the vibrating screen. Minus 1/2-in. material and dust from the system are diverted to a steel tank, surge bin for the adjoining agricultural limestone preparation system.

Finished material from the screen is conveyed to the rail car loading spur. Here is a pair of 100-ton capacity steel, rectangular bins designed to load rail cars by gravity. Swing chutes beneath the bins permit the operator to load and trim rail cars as they move slowly under the bins. **END**

### MAJOR EQUIPMENT REFERENCE

Quarry shovel,	
1 1/2-cu. yd. ....	Lima Works, Baldwin-Lima-Hamilton Corp.
Wagon drill .....	Ingersoll-Rand Co.
Haulage trucks (2) .....	Chevrolet Div. GMC
Belt conveyor system .....	} Link-Belt Co.
Vibrating screen, 5 x 14 ft., 3-d .....	
Design and layout ...	Link-Belt Co. and Montevallo Limestone Co.



A couple of crushers and a screen are linked with conveyors to provide the 200-tph. rock preparation system at Montevallo Limestone

*A new process licks water problem as  
it scours clay from selenite and opens  
up a vast deposit in the Nevada desert*

## Pabco's gypsum crystals sparkle

by John H. Bergstrom

**A** REMARKABLE WASHING SYSTEM has made it possible for a western gypsum producer to use a fabulous Nevada lode. The Pabco Gypsum Div. of Fiberboard Paper Products Corp. has installed a 75-tph. processing system at Apex to prepare raw materials for the company's wall-board plants at South Gate and Newark, Calif.

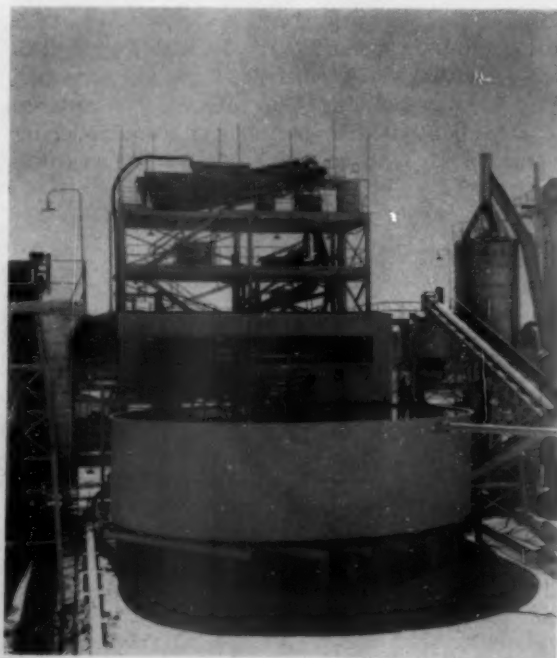
This system is probably the very first of its kind. It represents the careful study and thoughtful resolution of the problem of removing clay from masses of selenite crystals. This form of gypsum is bedded with alluvial clay in an enormous lens estimated at more than 750 million tons. The clay is deposited in veinlets in the interstices between clumps of crystals.

The new deposit covers about 7 sq. miles and is 200 ft. deep in places. With the successful new processing technique Pabco can proceed with development of the deposit that now replaces the Henderson installation. The uniformly high purity, dry finished product has proved to be ideal for board and plaster making as well as for portland cement. There's now no possibility that gypsum supplies at the new location will be exhausted in the foreseeable future.

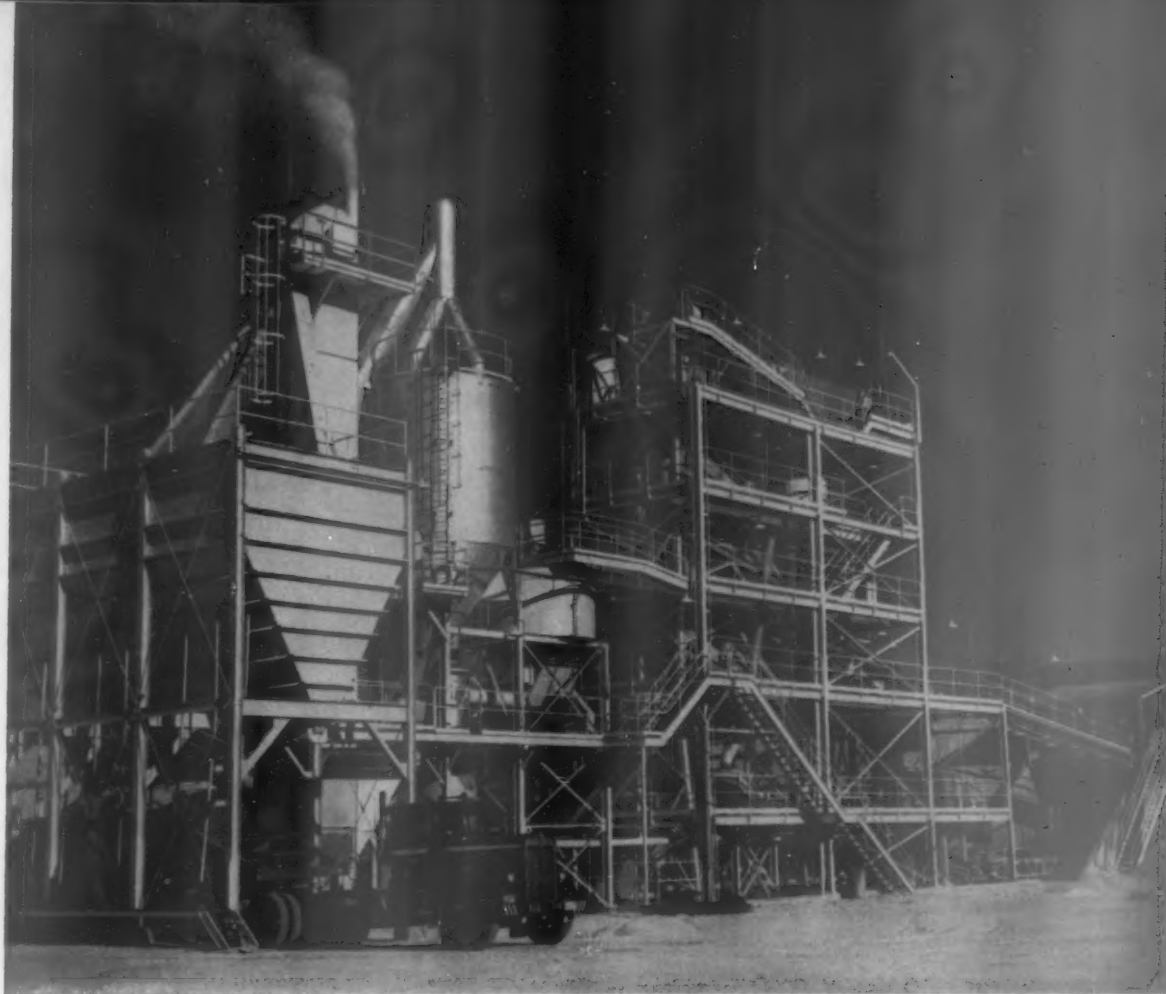
Since any clay is detrimental to gypsum products, the problem is how to remove it quickly, simply and inexpensively while wasting a very minimum of the valuable gypsum fines in the process. Tests showed that a plant feed of about minus 1/2-in. liberates or exposes the clay so that

it can be eliminated. Fortunately, the clay is easily suspended in water and simple agitation effects physical separation. This is followed by efficient screens that separate the slimes from the gypsum. Centrifuges strip the final fraction of fines from the slurry. All recovered gypsum is dried without hazard of calcining it, while a thickener recovers the valuable water for recirculation through the washing system.

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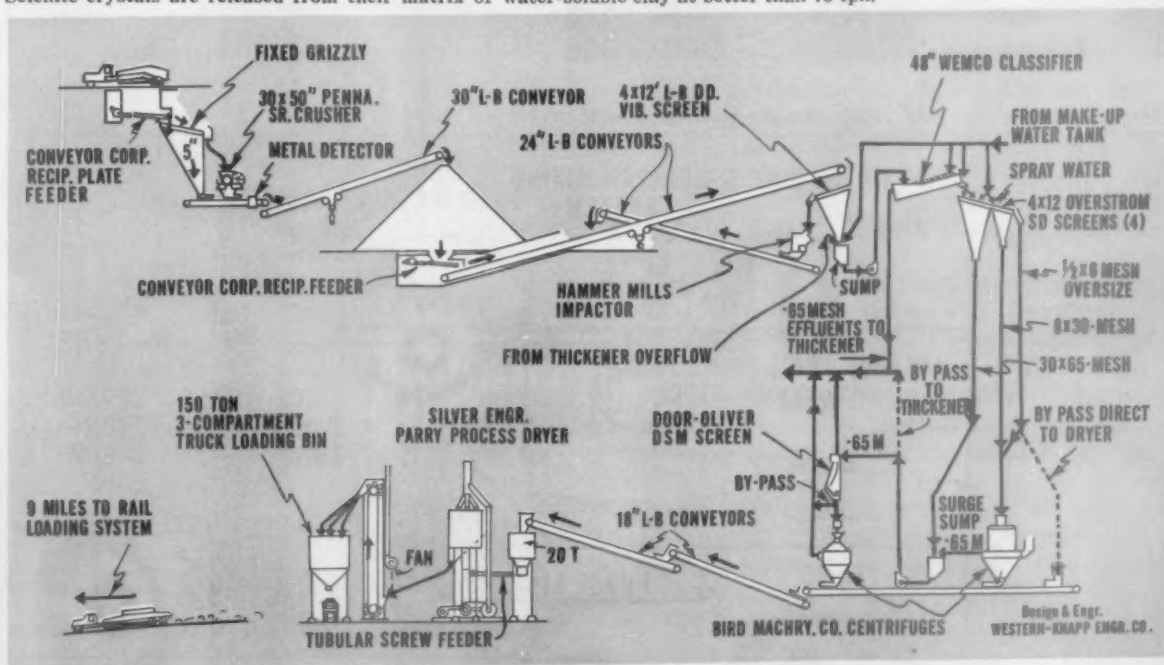


This 45-ft. diam. thickener helps to conserve water at Pabco Gypsum's desert washing plant. As it is, water losses average about 6,000 gal. per hr.



Pabco's gypsum washing plant at a glance: Raw material comes in at the right; is washed, screened and centrifuged in the tower; dried; then shipped from bins at the left

Selenite crystals are released from their matrix of water-soluble clay at better than 75 tph.

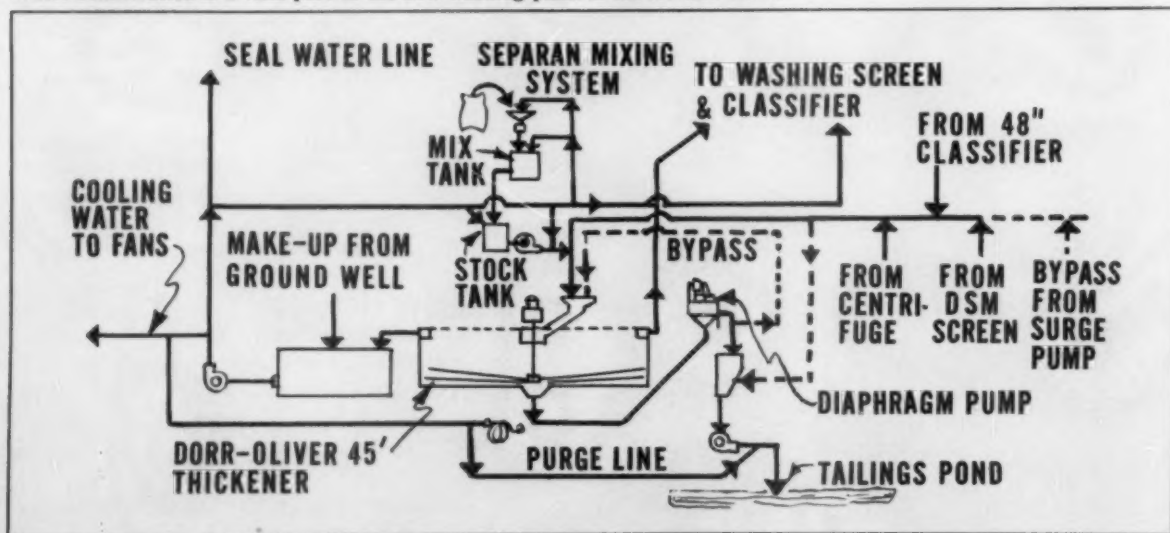




Much of the burden for separating clay slimes from gypsum is carried by this 48-in. screw classifier at the top of the tower

Left: Gypsum is scrubbed and tumbled in four parallel, five-step vibrating screens with spray bars

Water conservation is a vital part of the new washing plant in the Nevada desert



## PABCO'S CRYSTALS SPARKLE . . .

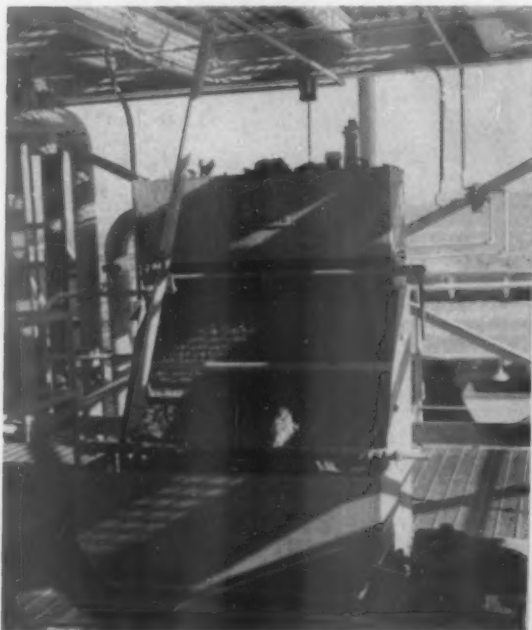
*continued from page 91*

After Pabco engineers had worked out the preliminary flow sheet, an engineering firm developed the details of a 75-tph. processing plant. Here's what they came up with:

Plant feed is ripped from the nearly level quarry with a 425-hp. bulldozer equipped with a triple-prong, straight shaft ripper. After a series of careful tests, the large dozer proved faster and more efficient than smaller units. Lateral fracturing has been good with little production of objectionable fines.

In addition to its ripping chores, the bulldozer also push-loads a 21-cu. yd. scraper that delivers the plant feed to a drive-over hopper above the primary crusher. While the scraper is making its half-mile haul to the plant and back, the bulldozer rips another load. Ripping and hauling time are closely enough matched to result in almost perfect equipment coordination. Quarry operations are designed to produce as much as 250-tph. of raw gypsum so that one shift in the quarry can keep the washing plant on a 3-shift schedule.

The 30 x 50-in. single-roll primary crusher reduces the plant feed to minus 5-in. After crushing, a 30-in. belt conveyor carries gypsum to a 1,100-ton storage pile. A plate feeder draws material



Water and slimes are stripped from the slurry of gypsum solids before they drop to a centrifuge

from the storage pile and deposits it on a 24-in. belt conveyor that carries it to a single-deck 4 x 12-ft. vibrating screen. Plus 1/2-in. oversize from the screen goes to an impact breaker for further reduction and is then recycled to the screen. The minus 1/2-in. drops through the screen to a sump, first unit in the gypsum washing system.

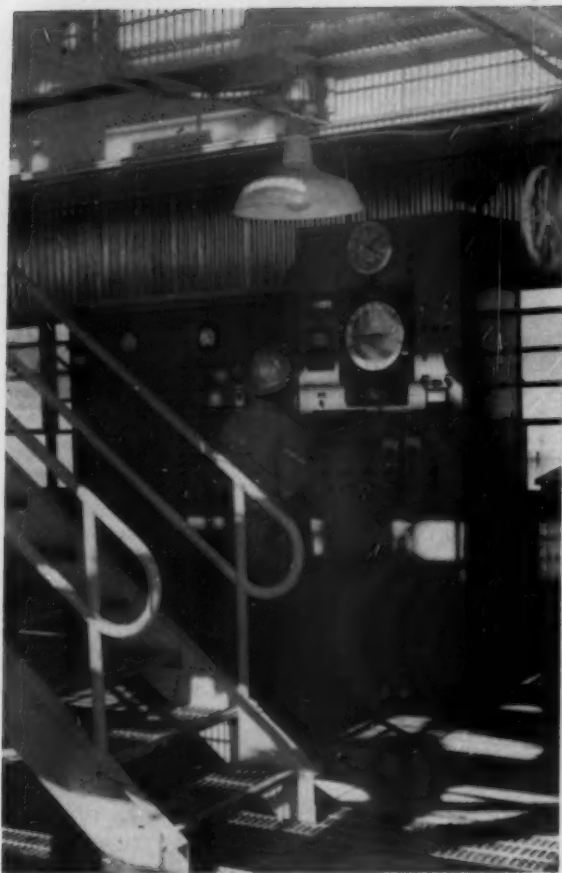
Water for the sump is a combination of thickener overflow and makeup water from a storage tank. The slurry of minus 1/2-in. gypsum is now pumped by a 5-in. heavy-duty sand pump to a 48-in. spiral classifier. This, the plant's principle washing unit, is placed in the top of a structural steel tower to achieve gravity flow for most of the subsequent processes.

Agitation in the sand pump starts the washing action that frees the 1/4-in. by 28-mesh gypsum from the clay matrix. Scrubbing is virtually completed in the classifier's slowly turning spiral. The classifier is mounted with less deck incline than normal, since it functions strictly as a washing unit, and is not intended to de-water the gypsum slurry. Additional water from the makeup water tank provides counter-current flow. Most of the clay and other slimes flow over the weir of the classifier and go directly to a 45-ft. diam. thickener. The material leaving the classifier is further slurried by water added at the discharge port. There it is split into four fractions and sent to 4 parallel, 4 x 12-ft. single-deck screens for further washing. Each screen has 5 step decks with spray bars mounted over 4 of the 5 steps. The gypsum is thoroughly scrubbed and tumbled as it passes across the screen. The first 4 sections of the screen take out minus 30-mesh fines; the fifth section passes minus 6-mesh.

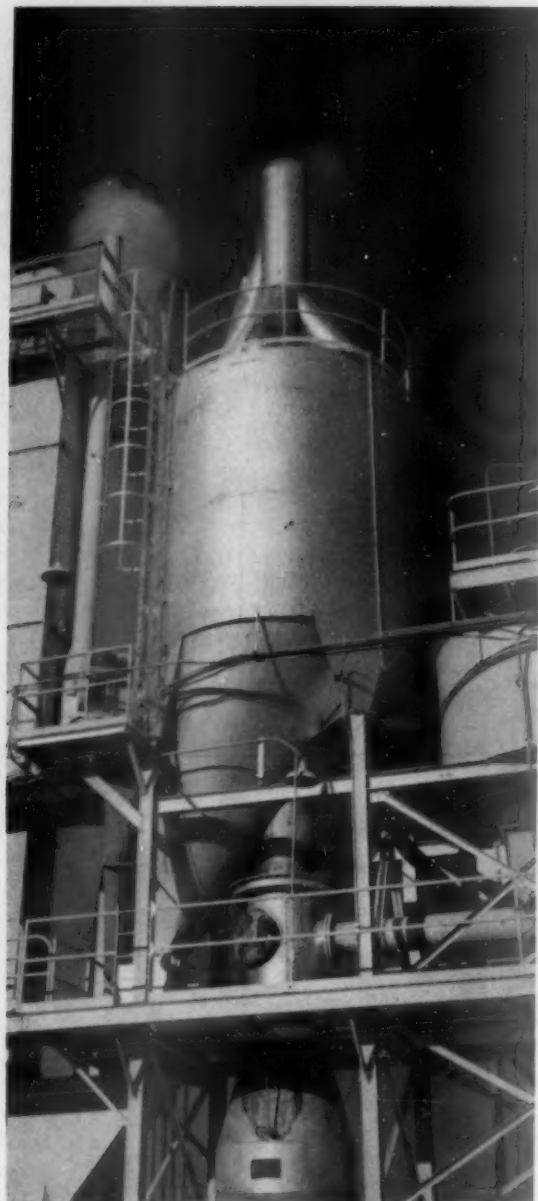
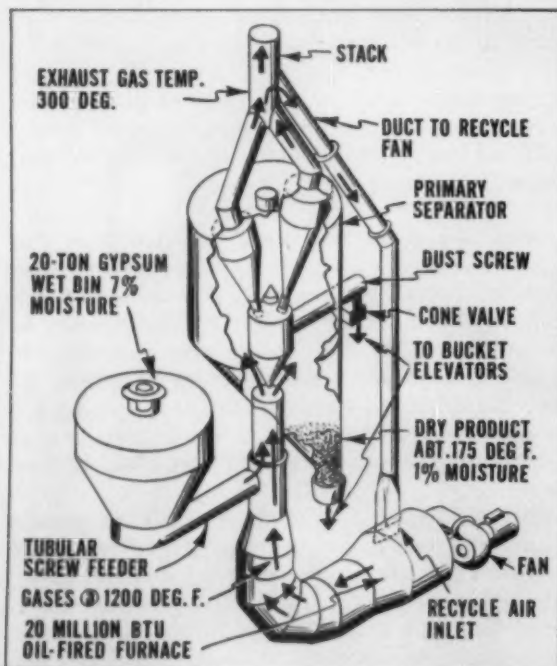
Both the 1/2-in. x 6-mesh oversize from the screen and the 6 x 30-mesh material normally pass together directly to a centrifugal de-waterer which reduces the moisture content of the gypsum to about 7 percent. The original size separation is made because an alternate flow arrangement allows the drier plus 6-mesh material to by-pass the de-waterer and go directly to the conveying system leading to the surge bin above an oil-fired dryer.

Minus 30-mesh pulp drops through the screens to a sump, and is pumped from there to a DSM screen. This screen removes all slimes and minus 65-mesh material which flows directly to the thickener. The 30 x 65-mesh gypsum goes to a second centrifugal de-waterer.

*Please turn page*



All operations in the plant—from the surge pile to the storage elevator—are controlled from these two panels



Final step in gypsum processing is the oil-fired dryer (center) with its feed hopper (right) and elevator for finished products (left)

A vertical dryer with 4 integral dust collectors effectively takes out moisture from the  $\frac{3}{4}$ -in. by 65 mesh fine gypsum crystals

## PABCO'S CRYSTALS SPARKLE . . .

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The DSM screen, so called because it was developed by the Dutch State Mines for screening fine coal slurries, has proved unusually effective in making the 65-mesh separation. As described previously (ROCK PRODUCTS, September 1960, pp. 137-148), the screening surface is a segment of a large circle mounted vertically. The slurry passes tangentially at high velocity across the screening surface. The screening surface consists of parallel tapered steel bars. Because of the high velocity of the slurry passing across this surface, the maximum size particle that will pass through the screen is about one-half the width of the screen openings. This completely eliminates blinding that usually occurs when screening material is in the near-screen size range. Capacity is quite high because the high velocity of the slurry passing across the screen allows a large volume to be processed.

Pabco's laboratory tests showed that 65-mesh was the most practical size at which to reject solids and send them to waste. At this point, virtually all the clay and slimes are eliminated from the plus 65-mesh gypsum, allowing it to meet Pabco's high raw material standards. A few gypsum fines remain in the tails (minus 65-mesh), but a study of reclamation methods revealed it was not economical to retain any of them.

Process water recovery is of vital importance in the arid Nevada desert. All plant water eventually ends up in a 45-ft. thickener. Flocculant is added to the thickener with an automatic mixing and metering system to speed settling of the clay and other suspended solids. Solid flocculant is added to the automatic system once every shift.

Water reaching the thickener from the centrifuges and DSM screen usually has about 20 percent solids. The thickener underflow is about 50 percent solids and is pumped half a mile to a tailings pond. One overflow line from the thickener flows to a 75,000-gal. capacity storage tank. Here, it mixes with makeup water that is pumped from Lake Mead, 7½ miles away. Water loss in the system is about 100 gpm.

All three gypsum fractions—30 x 65-mesh, 6 x 30-mesh and ½-in. x 6-mesh—are recombined after de-watering on an 18-in. conveyor belt leading to a 20-ton storage bin ahead of the dryer. At this point the dewatered gypsum averages between 6 and 8 percent moisture. To prevent this damp material from arching over the screw feeder supplying the dryer, an agitator is installed in the discharge cone of the bin. It is synchronized directly with the screw feeder and guarantees a steady flow of gypsum to the dryer.

The dryer is simple and efficient. It is carefully controlled to provide maximum drying action without starting to calcine the gypsum. With a capacity of about 80 tph., it reduces moisture to less than 1 percent in the dried material.

Dust collection at this plant is a matter of economics, not air pollution, since the air-borne fines represent premium quality gypsum. High-efficiency cyclones, an intrinsic part of the dryer, reclaim almost all of these fines. Bunker C fuel fires the dryer. This proved to be much more economical than building a 9-mile gas line from the nearest source of commercial gas.

An elevator takes finished gypsum from the dryer's collection hopper and elevates it to one of three compartments in a truck loading bin. A contract carrier hauls the finished material in bottom-dump trucks 9 miles to the rail head over a carefully engineered private road.

Two adjoining panels control all plant operations except the primary crusher. The controls are interlocked so that a failure in any unit automatically shuts off all preceeding units.


Trucks unload into a 70-ton drive-over hopper at the rail spur. A conveyor draws from the hopper to load the covered rail cars for the final trip to Pabco wallboard plants at Newark and South Gate, Calif.

A car puller is used to spot the cars. The siding, adjoining the main line of the Union Pacific, has room for 18 cars above, and 18 cars below the spot. A diesel generator supplies power for all equipment at the rail loading point.

END

### MAJOR EQUIPMENT REFERENCE

Bulldozer	Euclid Div., GMC
Carryall-scraper, 21-cu. yd.	
Plate feeders, (2)	Conveyor Corp.
Single roll crusher, 30 x 50-in.	Pennsylvania Crusher Div.
Vibrating screens, 4 x 12-ft. DD	Link-Belt Co.
Vibrating screens, 4 x 12-ft. SD (4)	Overstrom & Sons, Inc.
Screen, DSM	
Thickener, 45-ft. diam.	Dorr-Oliver, Inc.
Impact breaker	Hammermills Inc.
Belt conveyors	Link-Belt Co.
Spiral classifier, 48-in.	WEMCO Div., Western Machinery Co.
Dryer	Silver Engr. Works Co.
Centrifuge, coarse	
Centrifuge, fines	Bird Machinery Co.
Electric motors	
Control center	Westinghouse Electric Corp.
Pumps, centrifugal	Denver Equipment Co.
Pumps, centrifugal	A. R. Wilfley & Sons, Inc.
Pumps, fresh water	Wintrooth Pumps, Inc.
Pumps, diaphragm	Dorr-Oliver, Inc.
Pump, sump	Galigher Co.
Metal detector	Dings Magnetic Separator Co.
Bucket elevator to truck bin	Jeffrey Mfg. Co.
Haulroad design	Chas. O. Greenwood, Jr.
Design & engineering	Western-Knapp Engr. Co.
	& Fibreboard Paper Products Corp.



*After May 1, the cement industry and its allies will, no doubt, feel labor's financial grip tighten. But here is the other side of the picture: Why labor feels its demands are fully justified*

## Union demands Cement

**L**ESS THAN A MONTH FROM NOW, officials of the United Cement, Lime & Gypsum Workers International (AFL-CIO) will face the one segment of the rock products industry with greater than ever demands for a new 1-year contract. Cement companies probably are already aware that they will be asked to step up the payroll with a package estimated at 16¢ per hr. They also are possibly aware of the major terms specified—a 10¢ per hr. wage boost; 4-week paid vacations after 20 years instead of 25; time and a half instead of time and 3/10 for Saturday and Sunday work in plants running a 7-day week, and a 2 to 5¢ per hr. pay increase for men on 2nd and 3rd shifts.

Why is the union boosting its demands in the face of a widespread recession? What are its "official" attitudes, both toward the workers it represents and toward the employers with whom it must negotiate? To get the viewpoint of organized labor, ROCK PRODUCTS recently visited Felix C. Jones, general president, and Toney Gallo, general secretary-treasurer, in the Union's Chicago-based International Headquarters.

"Crocodile tears" is the way these top union men describe company complaints of decreased earnings, tougher depletion allowances, stabilized prices and variously caused construction slowdowns. True, sales were down in 1960 as compared with the preceding year but, they remind us, the year still ranks as one of the highest in history. In 1961, more dollars of the cement-swallowing road building project allotments will actually go for construction, making the outlook rosier for many manufacturers.

# swell-- producers worry

by Enid W. Stearn

How about cries of over expansion? Some industry leaders have predicted 1961 operations at only 72 percent capacity. Others claim there is no incentive to expand unless they can successfully operate at 85 percent capacity. Does the union expect companies to operate at close to 100 percent regardless of sales, simply to provide employment for its members?

Ridiculous, say union men. They claim that even 70 percent production is profitable, and unemployment is a problem they will always have to live with. Mr. Jones declares, "Although I'm not pessimistic, I can't say whether or not we'll ever reach 90 percent production. The trouble is, in our industry men are paid only when they work. So even at a \$2.50 average rate, and with unemployment benefits and SUB, most of the workers have annual incomes well below the U. S. Bureau of Labor standards. We think employers should feel the same responsibility to men who are laid off as they do to those who retire after serving them faithfully." The union has sought a guaranteed annual wage for some 20 years, but is not optimistic about achieving it in the near future.

And depletion allowance woes make no impact on union officials. Mr. Gallo points out that formerly companies financed their expansion and other programs in the money market. Then, when one segment of the industry began figuring depletion on the finished product, it spent the money thereby saved on mechanization. Recent developments probably indicate that these producers will again have to borrow to increase operations, but the union is not worried that this will seriously hinder expansion.

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## UNION DEMANDS SWELL . . .

*continued from page 97*

Regional pay variations are extremely marked in the cement industry, according to Gallo. Membership pressure has induced the union to try to eliminate these variations. When all factors are taken into account, the union feels that the cost of living really does not change much from one part of the country to another; even if it did, it be-

*Information in this article was obtained directly from union headquarters. Attitudes and opinions expressed are those of the union, and not necessarily those of ROCK PRODUCTS. Their presentation is intended as a service to the cement manufacturing industry, so operators will know what labor's official viewpoints are during discussion of new management-labor contracts. We sincerely hope that these official pronouncements will be of help to producers in those negotiations.—The Editors*

lieves, this would be irrelevant to preserving justice. They argue that a manufacturer cannot buy equipment any cheaper because he plans to use it in Atlanta rather than Seattle. At present, the union is not active in this dispute, but it plans to renew efforts in the future.

The union feels, in general, that benefits as well as wages are substandard for 1961, even though employers claim that they do much better by their men than do other companies in the same area. Very often, union men point out, a cement plant will be the only "big" industry in a small town. As such, it may actually be more liberal, even though remaining substandard for the nation as a whole.

The union claims to have made great strides in racial integration, refusing to be party to any agreement in which workers are not paid on an equal basis. There has been some attempt to foster integration within the plants, and the union itself makes no differentiation. For many years, Mr. Jones points out, Negroes have served as local officers, even in the deep South.

Machines have been invading the ranks of men since the onset of the Industrial Revolution. The first machines replaced only one man; now they can replace many, play chess, even rule entire factories by automation. The demoralizing influence has been expanding, and still is met with anything but resignation.

Why does the union fight the benefits of mechanization? Its leaders claim they are not opposed to mechanization as such. They are feeling the pinch through loss of membership, and report that for the past three years, out-of-work fees have been coming in with three times their usual frequency. True, production has risen about 60 percent they say, but there are fewer workers. And of those employed, there are much higher ratios of foremen, clerical help and mechanics.

So they agree that mechanization has obliterated much of the dirt and drudgery. Skills and responsibility—particularly responsibility—have been definitely upgraded. Whereas 20 years ago 40 percent of a plant's help might be common, unskilled labor, the union thinks it's closer to 16 percent today.

But while it is obvious to the union that the top positions require greater skills and demand more pay, there are often created more just plain base-rate jobs. Thus the chief operator rises, while his

helper is downgraded with less responsibility, less chance for advancement due to fewer top spots and comparatively less pay than before. Mr. Gallo states that in 1954 there were 175 employees per plant, on the average. Now there is an average of 130, and some of the new plants will only require around 60. With automation on the rise, there is no telling how soon an entire plant will be robot-run from a central control board. He reports that in some plants today so many workers have been laid off that the youngest man has 15 years' seniority!

**Training unskilled labor** and retraining those whose jobs have been mechanized—this is something everyone agrees is necessary. But the union itself feels it is not large enough to undertake a training program. Furthermore, it considers the industry to be the wrong type to make it practical, unlike the electrical industry rising to the rapid development of electronics. The union does try to insist that employers train present help to operate new equipment instead of importing outsiders. And it believes that employers are gradually coming to realize their responsibilities along this line.

**Washington encounters no direct lobbying** from this union, which prefers to operate through the Industrial Union Department.

On the Government scene, officials are very hopeful that the minimum wage bill will go through. When asked about warnings that a \$1.25 base would create further unemployment, they reply that these claims are phony—"historically proven false"—that actually one and all would benefit from more money in circulation. They look forward to stimulation of construction by the Kennedy Administration—especially with regard to housing projects. The union has no comment to make on recent FTC anti-trust rulings. Mr. Jones says: "As long as industry assumes responsibility toward the workers, we are not concerned. This is a question for the courts."

**On May 1, the 2-year contract** covering 17,000—or approximately half—of the industry's workers expires. One-year contracts have been the tradition; although the 1959 two-year contract was an exception, the union emphasizes that its door is not closed to other arrangements in the future.

Union contracts currently cover 135 of the



Getting set to discuss proposals, District Council No. 1 officers greet officials from International Headquarters in Chicago. From left to right are: Toney Gallo, general secretary-treasurer; Paul H. Balliet, district representative; John Pokrifcsak, Jr., district president; Roland S. Roth, district executive secretary-treasurer, and Felix C. Jones, general president

172 operating cement plants. Of the others, 28 are under the helms of 12 different organizations and little attempt is made to recruit them. For instance, Universal Atlas workers, being so closely coordinated with the steel industry, are covered with steel union employees. The organizations are cooperative, but contract dates and other scheduling rarely coincide for effectively concerted action.

Texas is the home of 6 of the 9 plants that have remained non-union. Another independent outfit is South Dakota's state-owned cement plant. Needless to say, the union is making efforts to bring their manpower into the fold.

**Will a May 1 deadlock result in a strike?** Union word is that this would be a last resort measure; officials are very hopeful for a completely satisfactory agreement before this date. Above all, they emphasize, employers should not imagine a threatening axe looming over their heads. According to Mr. Jones, "We feel we are a part of the industry and wouldn't do anything knowingly to hurt it. We only believe that our people are entitled to a larger share of the profits in what is a very profitable business. But we don't want war—if the industry suffers, we suffer!"

END

# CORSON PRESCRIBES RESEARCH FOR SUCCESS

by George C. Lindsay

**R** Take an old, sound company in a basic chemical industry. Add several parts of management philosophy that is based on research for progress. Mix one part dedication to not only customer service, but contribution to industry itself. Pour in a constant desire to create new products for industry and to expand the use of present products. Gently add a generous portion of simple humanitarianism in all of management's functions.

*This is a recipe for success--a formula for G. & W. H. Corson, Inc., of Plymouth Meeting, Pa., oldest and one of the most important lime and limestone products producers in the country*

CORSON JUST DIDN'T "HAPPEN" to be successful. It was planned that way. Even though the company is nearly 140 years old and is still guided by descendants of the founder Alan Wright Corson, a basic philosophy of planned success always has pervaded company management. But the past 20 years of company history have been unusually eventful, caused mainly by a bending of the basic philosophy toward an accent on various types of research.

Three brothers compose the current company management. Philip Corson is chairman of the board, Bolton is president and Carroll is executive vice president. All are "sold" on research, particularly Bolton. He was in charge of research and development of the Franklin Automobile Co. during the 1920's where he had an opportunity to witness the effective results of research.

He came back to his own company innoculated with the value of future progress based on research, determined to apply it to the lime and limestone industries through the Corson company. He started his work, on his own, in a small workshop at his home.

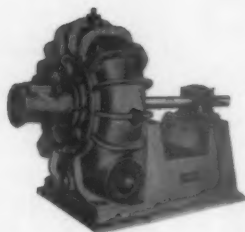
The company grew with each success, until now it has experienced four expansions in research facilities to see the largest, most complete company laboratory of its kind. It employs 35 scientists, engineers and technicians, working in a new build-

ing adjoining the company headquarters office building at Plymouth Meeting.

Early successes prompted the Corson brothers to bring Dr. L. John Minnick into their research program. When he got there, the Corsons handed him a polished cube of pure dolomitic limestone from their big quarries in Whitmarsh Valley, and presented this challenge: "Tear this material to shreds, down to the atom. Find out what makes it tick. Then put its parts together, recreate it and give us some new products that we can get into commercially usable form." That's the way the research department still functions, regardless of what materials are being handled.

Over the years a constant effort has been made to obtain the services of outstanding men with varying educational backgrounds and specific abilities. This has resulted in a well-balanced organization, including such outstanding men as the following who are listed in order of length of service with the company: Albert Roux, head of Pozzolan Products Laboratory; Cyril Presgrave, chief chemist; William Meyers, head of the Electrochemical Div.; Clifton Danforth, special development engineer; Ralph Williams, in charge of Poz-O-Pac Laboratory; James Jones, in charge of X-ray Diffraction & Spectrography Laboratory; Clarence Johnson, in charge of Lime Laboratory;

*Please turn to page 102*



# HOW TO MAKE MONEY

in the sand and  
gravel business

If you could increase your sand and gravel production  $3\frac{1}{2}$  times before you need any pump repairs, what would you do?

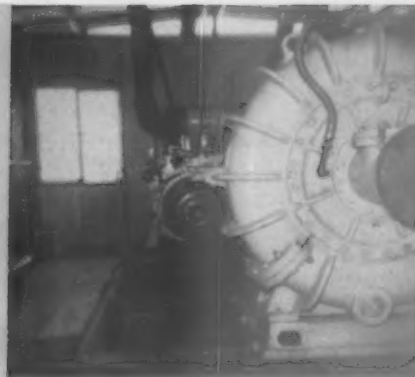
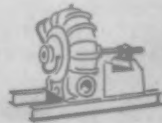
That is the performance record of Thomas DURABLE Dredge Pumps for Allendale Gravel Company, Allendale, Illinois. Read Mr. Litherland's letter at the right. His experience of over 7 years of low cost service of his first THOMAS pump was so satisfactory that he now has installed a second THOMAS pump. It is a matter of record that THOMAS pump users always choose another THOMAS when they need a second pump. They have learned that the wearing parts of Thomas pumps outlast the working parts of other pumps by a tremendously wide margin.

If you need a pump investigate the facts and you'll find you have been missing a good thing. You'll install a THOMAS pump because "you can not buy any other pump that will make you as much money."

Thomas DURABLE Dredge Pumps are manufactured in range of sizes from 6" to 16" discharge. Write or phone for additional information.



**THOMAS FOUNDRIES Inc.**  
P. O. BOX 1111, BIRMINGHAM, ALABAMA



Thomas pump installation at Allendale Gravel Company and James Litherland, Jr., whose letter appears below.



## Allendale Gravel Company

Screened and Washed Sand and Gravel for Road and Concrete Work

J. E. LITHERLAND

Allendale, Illinois

February 7, 1961

Thomas Foundries  
P. O. Box 1111  
Birmingham 1, Alabama

Attention: Mr. Joe Keeton

Dear Sir:

In May 1953, we replaced our manganese pump with a 6" Thomas durable dredge pump. Our old pump would need replacement parts about every 3 months or 30,000 tons total production. Our Thomas has produced as much as 100,000 tons total production without repairs.

In January 1960 we decided to increase our capacity by adding another pump. After 7 years of low cost service with our 6" Thomas pump we readily decided to use Thomas for our addition. Our new pump is a 10" suction 8" discharge and is producing sand and gravel from the Wabash river adjacent to our six inch pump located in a pit. We now feel our production has more than tripled since the installation of our first Thomas pump in 1953.

We want to take this opportunity to thank you for your cooperation and service without which this feat could not have been accomplished.

Yours very truly,

ALLIANCE GR. & S. CO.

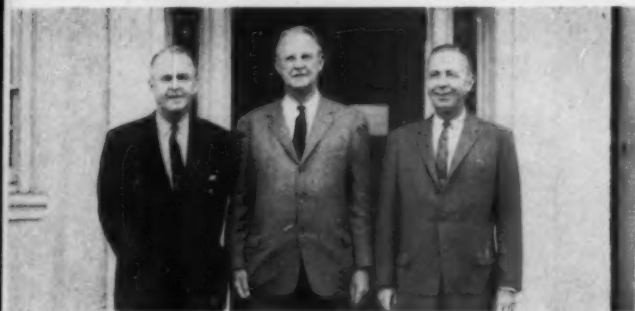
*James E. Litherland, Jr.*

JEL:kr

## RESEARCH FOR SUCCESS . . .

*continued from page 100*

Kenneth Clarke, head of Quality Control; John Allen, head of Plant Process Development; Thomas Pollock, in charge of Concrete Laboratory; Walter H. Corson, II, special projects chemical engineer; Harry Pfau, special projects engineer, and many others of outstanding capabilities.



The present generation of Corsons carries on the tradition of their 135-yr. old company—Philip (left) chairman of the board; Bolton, president, and Carroll (right) executive vice president



Unusual research calls for unusual research tools. Here's an electronic shock measuring device developed by Corson

With the above men, the company has been unusually progressive in obtaining the best possible equipment for their laboratories. An example of this is the very latest developments in X-ray diffraction and spectrography. By the use of this equipment, the amount of any of the chemical constituents of lime may be obtained in a period of twenty seconds. Furthermore, the exact form in which these constituents exist can be determined, and all of it done more accurately than by other methods.

Corsons' philosophy behind the research program is the big factor that provides the incentive for the whole research staff. Their plan is to develop new methods and products, and patent them if possible. Then, the new processes are licensed to others in the lime and related industries to give them the benefit of technical progress. Funds received from license agreements are poured back into research, along with those that come from cooperating agencies and companies.

Much of this latter type of work is done at the Corson laboratory. For instance, these are a few of the companies that cooperated on fly ash research: Philadelphia Electric Co., Consolidated Gas & Electric Co., Potomac Electric Co., E. I. duPont de Nemours & Co., American Viscose Co.

A basic plan for the research department developed rather quickly. Work is divided into six basic branches which, taken together, cover a wide scope.

► Testing. The laboratory is operated as a testing laboratory to obtain data on the physical aspects of quality control. But that isn't all. Part of the work is in developing testing equipment itself. As an example of this work the department has its own variation of a seismograph, which has been used in testing blasting to gain better results.

► Basic research. Much work is done on fundamental reactions, with an accent on reactions not known. "This is strictly ivory-tower research," as Dr. Minnick explains.

► Development of new products and markets for old ones. This is a primary branch of research that actually sets the stage for future Corson progress. Beginning 20 years ago, new processes and products began to flow out of research results. The number is growing every year. Some of them are: dead burned dolomite, dry carbonation process, Corson Hydration Process, many new products from fly ash including Poz-O-Pac, Home-Crete, and even a brand new type of battery with remarkable energy capabilities that is able to op-

*Please turn to page 104*

**ACCOMPLISHED:**

# **PEAK OPERATING EFFICIENCY...**

**AND SECO SCREENS**

**ARE THE VITAL**

**PART OF THE PICTURE**

Whenever you come across a rock products plant that's producing top tonnages, and operating smoothly and efficiently, take a look at the screens. Very often, you'll find those screens bear the SECO nameplate. All across the country, you'll find operators turning to SECO when they're adding or replacing screens. And for one very simple reason . . . *they can depend on SECO performance.* Performance in top tonnages when the going gets rough . . . performance in more accurately screened product . . . performance that doesn't let them down. Put your plant in peak operating efficiency . . . and start by building around SECO Screens.



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**SCREEN EQUIPMENT CO., INC.**  
Buffalo 25, N. Y.



## RESEARCH FOR SUCCESS . . .

*continued from page 102*

erate at temperatures 100 degrees below freezing temperature.

► **Customer service.** The Corson company can't get along without customers, and they make every effort to see that the customer gets all the help he needs in solving his problems. This involves a



Research is part of the Corson tradition, and President Bolton confers regularly with his team of 10 top scientists and technicians. There are more than 30 workers in the Corson laboratories



Cy Presgrave, chief chemist, is preparing a thin section of rock for a microscope study

lot of troubleshooting, and the laboratory staff is frequently called upon to assist the customer in his special technical problem.

► **Unit process development.** The company puts a "very important" tag on this branch of research. First, the research staff gets an idea. Then they work out the laboratory program and conduct experiment after experiment. Based on knowledge gained, a pilot plant is set up and a product is made. Thorough research is involved in every step.

► **Development of specifications.** This phase is tied directly into the development and application of both new and old products. Corson's research department actually has developed many federal, state and local specifications for lime, fly ash, refractories and stone.

**Recount of research results**, which have continued to build Corson, are too numerous to fully cover here. But they are characterized by the Corson Hydration Process that is referred to as "the most revolutionary development in the history of lime." This is a special explosion process of hydrating lime, invented by Bolton Corson and licensed internationally under a number of basic patents. When first developed, it was so unique that a new federal specification had to be written to cover it.

The new-type Corson battery is the invention of Dr. Minnick, and basic patents covering it have been issued. The development of ammonia batteries was derived from a research program relating to the electrowinning of alkali and alkali earth metals from salts of these metals dissolved in liquid ammonia. The new battery was the result of complete research directed at this phenomenon. It will be produced by the Livingston Electronic Corp., which has recently been acquired by the Corson Co. The Eastman Kodak Co. has also been licensed to produce this battery.

Fly ash research at Corson represents the application of every branch of the research department. This work began in cooperation with several electric utility companies on the east coast. Through basic research, the development of new processes and equipment, Corson was able to separate fly ash into three separate products. These are a ferro-pozzolan which is an iron product containing 80-85 percent pure  $Fe_2O_3$  (later benefited to 98 percent pure); a high early strength pozzolan containing a high silica content and sized below 160 mesh, and the coarse fly ash that includes much unburned or partly burned coal.

The ferro-pozzolan has a market as a specialty

*Please turn to page 106*

# NOW! A practical, trunnion-drive ball mill

To all of the superior features of the KENNEDY Ball Tube Mill is now added the finest of mill drives.

This new KENNEDY Mill features:

A clean in-line drive arrangement—the first *practical, factory-sealed, symmetrical drive*—cuts field erection cost; shortens field erection time; Horsepowers up to 3300. Trunnion bearings of the most advanced design—self-aligning with water and oil-cooled non-scoring bronze alloy liners; sizes are generous for lowest bearing pressures.

Heavy duty mill shell—stress relieved after fabrication; flanges machined simultaneously.

Proven performance in actual service—a remarkable record of consistent greater-than-rated capacity performance on grinding of clinker at a prominent cement plant.

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TRUNNION MASTER  
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ROCK PRODUCTS, April, 1961

105

## RESEARCH FOR SUCCESS . . .

*continued from page 104*

product in the steel and electric industries. The high early strength pozzolan may be used in portland cement concrete and as filler for asphalt. Ceramic bricks have been made from fly ash on a research basis.



Better customer service is one of the immediate, highly practical results of research. Here, bulk lime is mixed with water as it is delivered by truck—a fast, safe and economical system



Basic research in lime reactions often involves high temperature, high-pressure equipment

The coarse product may be used as fuel by utilities in their furnaces or for other purposes.

One of the biggest commercially used products to come out of this research is Poz-O-Pac. It is a patented road base or sub-base product that incorporates lime and fly ash together with aggregate materials that usually are "in place" or near the site of use. Claims made for the material include low first cost, low long-term maintenance, high resistance to freezing and thawing, ease of construction and immediate use.

First test sections using Poz-O-Pac were put down in 1948. By 1950, it was used on a temporary road by-passing a bridge on the New Jersey Turnpike. After 11 months, that road was torn up and test sections showed compressive strengths of 4,000 pounds per square inch.

Real commercial work started in 1952, when 32,000 sq. yd. of the material were used on the Jersey Turnpike. Since that time it's been used on airport runways, highways, reservoir dams, parking lots, truck roads—on almost every conceivable type of construction.

An alternate technique in Poz-O-Pac use is preblending of hydrated lime and fly ash in a mixing plant and dampening with about 10 percent water. Product is then shipped to the job site and spread with a conventional road-type spreader. Reports show that control of mixing improves quality, and that the material can be spread as much as three times faster than other types of paving.

What about the future? "Lime is the world's most important alkali—a basic chemical industry," Dr. Minnick pointed out. He believes that the whole complexion of the industry is changing and that lime's future gets brighter with each passing year. Corson, you can be sure, is going to be right in the middle of that change and growth.

Right now, the company has a number of new products on the fire, and they expect to have more every year. But it doesn't stop there. Not only is it the company's business to produce new products for new markets, but they expect to enlarge the facilities of present lime operations. The move in that connection is toward mechanization, automation and resulting improvement of productivity.

Dr. Minnick credits the Corsons and their philosophy for the many successes that research has brought to the company. "We are fortunate," he said, "to have a management with breadth of vision, enthusiasm for research, and confidence in the future."

END



## TYLER OFFERS UNIQUE TECHNICAL SERVICE IN SCREENING

An abrasive manufacturer wanted to know how to separate his raw material in several different grit sizes—sent a sample to the Tyler Customer Service Laboratory. Here the material was separated on production-size vibrating screens, with a variety of wire cloth types, permitting positive recommendations on equipment and wire cloth for each specification desired.

This type of technical service will help you obtain—in your own plant—the lowest possible screening cost. Call Tyler for help on your separation problems. From thousands of types of Tyler woven wire cloth, we can recommend the right type for your requirements.



**Standard of the world** Tyler Standard Testing Sieves are recognized world-wide as the standard for classification of granular materials. This testing equipment tells you what sizes are present in raw materials, relative proportions, and helps you meet specifications and control quality.

### TYLER CUTS YOUR COST OF SCREENING

- Requirements matched from world's broadest line of wire cloth
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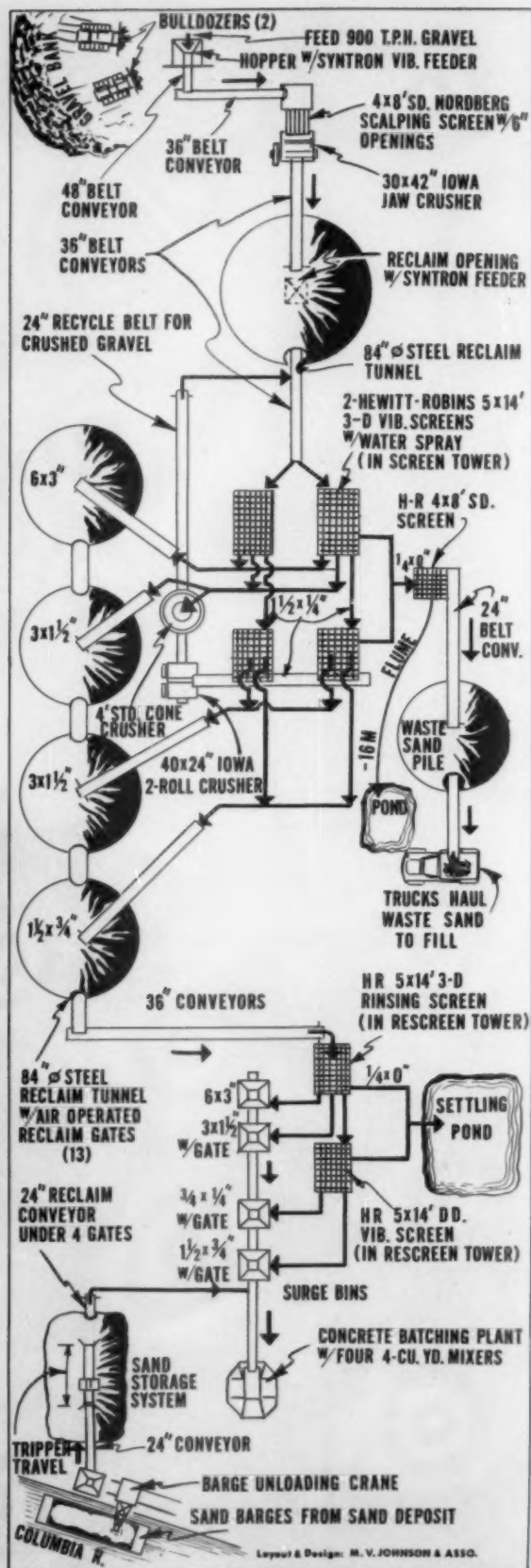
A PRODUCT OF CHRYSLER CORPORATION

# TOUGHEN YOUR FLEET WITH DODGE HEAVY-DUTIES

Dodge heavy-duty trucks for 1961 are the toughest, stingiest, workingest trucks we've ever built. Engines have been improved, beefed up all 'round. There's V8 gasoline muscle to 228 H.P., and Cummins diesel muscle to 743 cu. in. and 220 H.P. Frames, clutches, transmissions and axles have been strengthened to match. Swing-out fenders let you walk right up to the engine and service it fast. A BBC of 89¾" lets you put more load on less wheelbase, or pull a longer trailer. Those are two advantages of Dodge's cab forward design. Another: the cab simply can't go haywire, nor do you have to raise the roof to accommodate it. If you own a tilt-cab, you'll know what we mean. Toughen your fleet from a big choice of Dodge heavies. Trucks and tractors. GVWs from 19,500 lbs. to 53,000 lbs. GCWs to 76,800 lbs. Two other things to think about. The heavy-duty Dodge for your job is probably waiting your order today at a Dodge Truck Center. And now there's a 24-hour-a-day, seven-day-a-week ordering system for emergency parts. Delivery's soonest!

## DODGE BUILDS TOUGH TRUCKS





*1,100-tph. setup produces torrents of specification sand and gravel for massive Columbia River bulwark*

# *John Day Dam*

## breeds giant aggregate system

by John H. Bergstrom

**L**ARGEST AGGREGATE PLANT in the northwest since the completion of the Grand Coulee Dam two decades ago is now working at John Day Dam on the Columbia River. With a capacity of 1,100 tph., it is one of the largest sand and gravel processing plants in the country. Reason for this giant project is the monster dam that will require more than 2 million cu. yd. of concrete in an almost continuous pour before it is completed five years hence.

Everything about the dam needs superlatives to describe. The straight-line axis dam itself will be 5,900 ft. along the crest, and it will cost more than \$418 million before it is completed. Initial powerhouse capacity will be more than 1¼ million Kw., ultimately expanded to more than 2 million Kw. With its better than half a million acre-ft. of water storage, the dam will provide navigable slack water all the way to the foot of the McNary Dam 75 miles upstream. Of course, the water storage capacity will be available for both flood control and irrigation.

Like most big concrete dam structures, John Day Dam will be built in two sections to avoid any interruption of navigation or fish migration. First

work is underway on the northern, or Washington, shore of the Columbia River. When this portion of the dam nears completion, work will proceed on the southern segment.

And John Day Dam had a problem in common with many concrete dams in the northwest. Good aggregates were hard to find near the construction site. The nearest deposits that met the rigid specifications of the Corps of U. S. Army Engineers were about 14 miles away. With trucking costs estimated at 5¢ a ton per mile of haul, the contractor's costs would have been staggering.

The contractor, Montag, Halvorson, McLaughlin & Asso., was unwilling to assume this expense or to abandon hope of finding a closer source of aggregates. One closer deposit of gravel had been passed over—not for lack of quality but because

*Please turn to page 114*

**Far Left:** Plenty of gravel is bedded in the rugged, forbidding terrain near the dam site on the Columbia River

**Left:** 900-tph. gravel processing plant for the John Day Dam. The contractors were fortunate to find a suitable gravel deposit adjacent to the dam site; the only drawback was the lack of fines in the gravel

**Right:** Central screening tower of the 1,100-tph. gravel plant is in the middle where it distributes finished aggregates to storage piles



## RAY-MAN CONVEYOR BELT



### RAY-MAN CONVEYOR BELTS On Giant Wheel Excavators Move Overburden More Than 400 Feet ...At 5100 Tons Per Hour!

High-speed belt conveyors, with huge carrying capacities, are an integral part of this new 1,600 ton wheel excavator built for Peabody Coal Company at Bucyrus-Erie Company. High conveyor speeds—over 1,000 FPM—and high impact, put a tremendous strain on belt and belt splice. Ordinary belts can't take it. Ray-Man Conveyor Belting met the production standards of Peabody's giant earthmover—to handle *full* loads of overburden at *full* speeds *without* costly downtime for splice repairs!

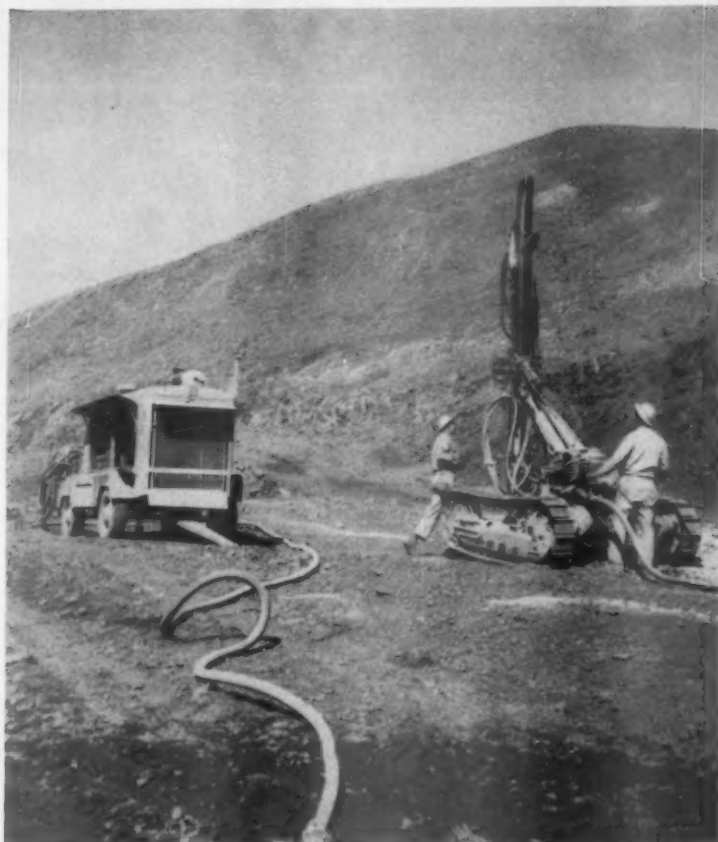
Ray-Man belts on other machines of this type have hauled over 12,000,000 tons—outperforming all competitive belts. Splices last twice as long because double ply compensation relieves outer ply stress at bends. Ray-Man trains naturally, resists impact and ripping, requires no breaker ply. Exclusive XDC cover prolongs belt life. Let an R/M distributor show you how an R/M Conveyor Belt can outperform other belts on *your* conveyors. Write for Bulletin M302 and Catalog 25CB.



OVER 900 FT. OF 54" RAY-MAN CONVEYOR BELT are required for digging ladder and stacker conveyors on this huge Bucyrus-Erie Wheel Excavator. Machine will help increase output a million tons annually at Peabody Coal Company's River King Mine near Freeburg, Illinois.



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It's flexible as a rope, too... the easiest handling air hose you can use. Homoflex has no pre-set twist... coils and uncoils in *any* direction *without* kinking. Strength member and tube are virtually inseparable. Uniform inside and outside diameters make it easier, *safer* to couple.

- **Super-Strong** — assures longer, trouble-free service life
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Ask about rugged Homoflex and other types of R/M hose for your applications. Write for Bulletins M620 and M694.

## R/M POLY-V<sup>®</sup> DRIVE More Power in Less Space ...With More Reliability

A single, endless V-ribbed belt across full width of sheaves with mating grooves. Gives more power per inch of width and advantages never possible with conventional multiple belt drives.

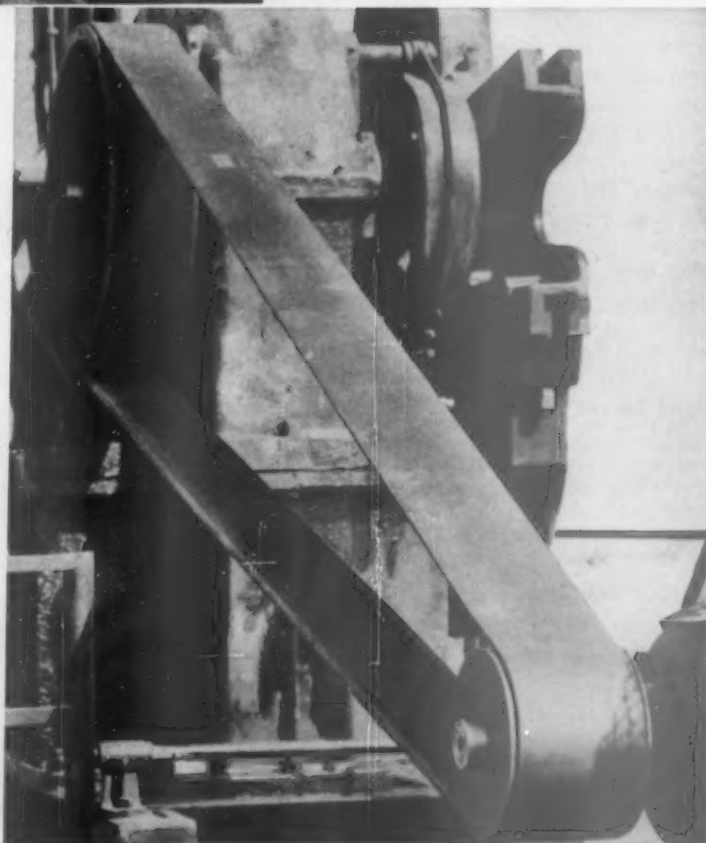
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Write for Bulletin M141.

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RM113R



## JOHN DAY DAM . . .

*continued from page 111*

of inadequate quantity. Any source of material had to have plenty of reserves, for the north section of the dam alone called for more than 2 million tons during the first year of placing concrete.

A seismic analysis was used to chart the actual size of this gravel deposit. When skeptical inspectors from the Corps of Engineers withheld approval while the contractor brought in drilling crews for more intensive exploration. Ultimately, several 100-ft. holes were dug and the strata analyzed before approval of both quality and quantity could be secured from the Corps of Engineers.

These tests showed that sand and gravel in the deposit was sound. However, the sand gradation was not all that could be wished for, since it was almost barren of sizes in the vital 8 to 100-mesh range. Therefore, the most economical arrangement was to waste the sands from this area. The contractor decided to abandon any plan to crush, resize and blend the fine sizes to meet the gradation specifications and to look elsewhere for natural sand.

An alternate source of top quality sand was located on the bank of the John Day River about two miles from the dam site. There a 200-tph. sand washing plant was erected to process the deposit, and the washed sand is barged to the storage area at the dam site.

"Our biggest problem," says Murray Johnson, designer of both sand and gravel plants, "was beating the calendar. Time was a factor in every decision we made." The final decision on the aggregate plant location was made January 20, 1960. The firm of consulting engineers engaged to design the plant started work February 13, 1960,

and the plant was stockpiling material May 22, 1960, in time to meet the June 1 deadline.

Shop and construction drawings took nearly two-thirds of the time spent in designing and constructing the plant. This careful planning paid off in quick, inexpensive erection on the job site and elimination of start-up delays. Over 400 tons of structural steel required for the plant were prefabricated in Portland and shipped to the job site where erection crews quickly placed it.

Four sizes of gravel are required to supply the aggregates for the 10 different concrete specifications incorporated in the project: 6 x 3-in., 3 x 1½-in., 1½ x ¾-in. and ¾ x ¼-in. In general, the pit run material is fairly evenly distributed, with a minimum of large boulders and only about 20 percent of waste fines.

Gravel plant feed is pushed into a hopper by two bulldozers. Gravel plant feed averages about 900 tph. A vibratory feeder below the hopper drops the plant feed onto a 650-ft. long extensible 36-in. belt conveyor. Whenever the push in the pit gets too long, the hopper and conveyor are moved forward.

Even with a failure in the pit, the large surge pile guarantees uninterrupted plant operation. A 4 x 8-ft. single rod-deck screen scalps off all plus 6-in. gravel, which goes directly to the primary crusher, a 30 x 42-in. jaw unit. Crushed material joins the gravel that by-passed the crusher and is conveyed to the 50,000-ton primary surge pile.

A vibrating feeder, in a concrete vault below the primary surge pile, draws off plant feed and deposits it on a 36-in. belt conveyor for the 400-ft.

*Please turn to page 118*

Sand barges are unloaded with a tractor shovel; a small hopper feeds the long belt conveyor, taking sand to storage



BRADLEY EQUIPMENT  
MILL AND SEPARATOR  
HEATER FOR DRYING  
by Todd Shipyards Corporation  
MILL FAN  
PRIMARY CYCLONE  
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Fan to Mill  
Mill to Cyclone Collectors  
Cyclone Collectors to Fan  
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by Buell Engineering Co., Inc.,  
Northern Blower Division



## 22 TONS-PER-HOUR AG-LIME AT 98% PASSING 20 MESH

Typical of Bradley work in the grinding field is this Pneumatic Hercules Mill installation at the Pine Creek Plant of Lycoming Silica Sand Company, Montoursville, Pa.

The installation takes Limestone of 2" maximum down to dust and containing, at times, as high as 10 to 12% moisture. The Bradley Mill System produces from this feed 22 tons-per-hour of finished material, with a fineness of 98.5% minus 20 mesh,

72 to 75% minus 100 mesh, containing approximately 1% moisture.

Bradley manufactures a full range of Pneumatic Mills with or without Flash Drying for finenesses up to 325 mesh... plus Bradley Hercules Screen-Type Mills to handle your semi-fine pulverizing requirements.

Bradley will test-grind your materials in their grinding facilities at Allentown, Pa., *without cost*. Write for details.

See Chemical Engineering Catalog or write for Bradley Catalog No. 63



**BRADLEY**  
**PULVERIZER COMPANY** LONDON • ALLENTOWN, PA. • BOSTON

*Superior Grinding Equipment Since 1891*



*From a profit-minded Wisconsin gravel producer—*

## **6 unusual money making ideas**

*Unusual proven ideas, you might say. For Wesley Peterson, owner, Gillett Cement Products, Gillett, Wisconsin, has been working on them and refining them, proving and improving them ever since the war.*

### **Michigan Tractor Shovels dig pit-run, eliminate blasting**

Let's take his pit operation first. Three good ideas here. Michigan *digging power* accounts for two of them. Both the company's 4-year-old Model 125A and their two newer Model 175A's have the breakout force to *eliminate blasting*. Rarely, in fact, need a machine use non-loading passes to loosen the gravel material. Three scoops of a 2½ yd Model 175A bucket heaps a 10 yd hauler. Time, 1½ minutes. The 2¼ yd Model 125A needs only four scoops, 2 minutes.



### **Strip rocky clay overburden**

The Michigans also strip overburden. Part of this is *bucket-dozed* over a bank, part is picked up and carried.

Carrying constitutes a major production advantage where any distance is involved, according to Mr. Peterson, and is one of the reasons he prefers a Michigan Tractor Shovel over a dozer for this work. Speed is another reason . . . for example, on one recent job, one Michigan stripped an acre, *up to 12 ft deep*, in three days!

### **Truckers load own trucks**

Another major saving has been instituted by Mr. Peterson at his portable crusher. When there's lots of work to be



done here, Mr. Peterson details one of his 14 employees as Michigan operator. *But usually, the machine is operated by each individual truck driver as he comes into the pit for a load.* "Michigans, with their power steer, power shift (no clutch) and torque converter, are easy for almost anyone to run well," says Peterson. His third Michigan is stationed at the material yard where it loads customer and company trucks, hauls sand for ready-mix, dresses stockpiles, etc. Letting each driver handle his own load may slow production slightly at peak periods . . . *but the specialized operators normally needed—and, as Mr. Peterson points out, definitely required on a crawler-loader or crane—can be assigned other work.*

### Do spare-time jobs for extra profits

Michigan speed and flexibility have given Mr. Peterson another big advantage. To fill slack periods, even of only



a few hours, the company actively solicits local businessmen, farmers and towns for those small jobs that build extra profits. Charges return a good income to the owner, yet are reasonable to the buyer. Including travel time and operator, Mr. Peterson gets \$15 per hour for either his gas-operated 127 hp Model 125A Michigan or his 133 hp diesel-powered 175A—\$18 per hour for his newer, more powerful 162 hp turbo-diesel 175A.

### Dig basements

Probably the most-frequent "custom job" is digging basements. "In our part of the country, with material varying



from hard clay to sand, Michigans are ideal for this work," says Owner Peterson. Typical basement—30 x 40 x 6 ft. deep—takes 3 to 5 hours. This includes time to strip and pile topsoil, also to carry and spread excess material in low spots (if any). Michigan leaves neatly-finished sides, say contractor renters. Little hand work is needed.

### Remove trees, stumps

Another interesting—and unusual—Michigan job has been clearing land. To reach one such task, on the hospital grounds in Oconto Falls, 10 miles away, took the self-powered Michigan less than 30 minutes. At work, the Michigan cleared brush, dug out stumps, even pushed over trees. Where trees are no larger than they were here, 1½ ft in diameter, operator simply raises bucket, rests it 8 to 9 ft up on the trunk, and moves forward. Four-wheel-drive topples the tree quickly, root ball and all. On other jobs,



such as one in the town of Gillett where trees averaged 3 ft and more in diameter, the versatile Michigan digs around the root, *then* pushes the trees over.

### Plow, remove snow

Even in the severe winters of northern Wisconsin, Mr. Peterson keeps his Michigans working. He has, for example a contract with the City of Gillett for removing snow from the main street of this community of 1,500 people. Other times, the Michigans plow parking lots and farm driveways. Standard bucket equipment is currently being used on all three units, but Mr. Peterson is investigating purchase of the quick-detach "Wisconsin Special" one-way and V-type snow plows recently made available for Michigans . . . also a larger bucket for loading snow (many choices, from 3 cubic yards up, are available through his Michigan Distributor, Aring Equipment Company). Other quick-detach attachments are available too: snow-blowers, crane hooks, fork lifts, street sweepers, backfiller blades, root rakes, etc.

Michigan is a registered trademark of

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**CLARK EQUIPMENT COMPANY**  
Construction Machinery Division  
2481 Pipestone Road  
Benton Harbor 13, Michigan  
In Canada: Canadian Clark, Ltd.  
St. Thomas, Ontario

## JOHN DAY DAM . . .

*continued from page 114*

trip to the top of the 70-ft. high main screening tower.

Here, the minus 6-in. gravel is distributed across two 5 x 14-ft. triple-deck vibrating screens. To handle the washing operation, 2,000 gpm. of water is pumped through a 10-in. line from the nearby river. Nozzle pressure on the screens is approximately 100 psi. This high pressure is required to scour off the minus 100 mesh sand that clings tenaciously to the large gravel.

The 6 x 3-in. from the top deck of the primary wash screens goes directly to storage. The 3 x 1½-in. material on the second deck can follow any of three paths. It can go to storage, to a 4-ft. standard cone crusher for secondary crushing, or to a waste pile. At the present time none of this material is wasted, although some waste is anticipated in the future to compensate for an excess in the pit.

The 1½ x ¼-in. oversize from the third deck is chuted to a pair of 5 x 14-ft. double-deck vibrating screens. The sand from this deck goes into the waste sand circuit. A 4 x 8-ft. single-deck vibrating screen scalps off all plus 16 mesh sand which is conveyed to a storage pile. The slurry containing the minus 16 mesh material flows to a settling pond. Stringent water pollution regulations prohibit returning waste water directly to the river.

The gravel retained on both decks of the second pair of wash screens can also take a variety of paths. Both products (1½ x ¾-in. retained on the top deck, and ¾ x ¼-in. on the second deck) can go to storage, to waste or to a 40 x 24-in. roll crusher for further reduction. The fines from these screens also go to the waste sand circuit.

A traveling tripper puts incoming sand into these large storage piles above a reclaim tunnel



Sand for the concrete mix is found 2½ miles away on the banks of the John Day River. After washing in the 200-tph. plant, it is barged to the dam site

Stockpiled material will allow the batch plant to operate for a week, should emergency arise. The storage piles are large enough to accommodate approximately 10,000 cu. yd. of each of the

*Please turn to page 120*



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## JOHN DAY DAM . . .

continued from page 118

4 finished sizes. Gravel ladders have been installed to prevent degradation of the three larger sizes of material as it cascades from the conveyors to the storage piles. During warm weather, water is sprayed on the stockpiled aggregate to keep it from getting too hot, since no provision has been made for cooling the concrete itself.

The batch plant operator has control of reclaiming and rescreening processes. Aggregate is reclaimed from storage on a 36-in. belt conveyor running through a 7-ft. diam. steel reclaim tunnel and carried to a rescreen tower. Two air-operated swing gates under each storage pile supply a steady flow of material to the belt. Specifications require the rescreening operation to eliminate stray material or material that has broken down during handling. The rescreen tower houses 5 x 14-ft. triple-deck and double-deck screens. Both are fitted with

spray bars as a further guarantee that all the difficult to remove minus 100-mesh sand has been eliminated.

The 3 x 6-in. size drops directly to the 36-in. conveyor leading to the concrete batch plant. The other three sizes drop into 15-cu. yd. holding bins. Gravel is drawn from the bins as needed.

Even with its high capacity and many alternate flow schemes, the gravel plant operation is handled by a crew of nine, including two night shift maintenance men. Careful provision for proper maintenance has almost eliminated downtime due to equipment failure.

The sand washing plant is located on the bank of the John Day River about  $\frac{1}{2}$  mile from its confluence with the Columbia, and about  $2\frac{1}{2}$  miles from the dam site. The deposit, which contains sufficient high-quality reserves for the whole project, fortunately has very little plus  $\frac{1}{4}$ -in. oversize. About 200 tph. of plant feed is dozed into a sand hopper where a 30 x 72-in. pan feeder loads a 24-in. conveyor for the 100-ft. haul to the top of the washing and screening tower.

The top deck of a 6 x 16-ft. double-deck vibrating screen scalps off all plus  $\frac{1}{4}$ -in. fine gravel. No attempt is made to use this small quantity of oversize. To prevent plugging at the feed end of the screen, water is introduced in the chute distributing feed to the top deck of the screen. The sand plant uses 3,000 gpm. of water pumped from the John Day River.

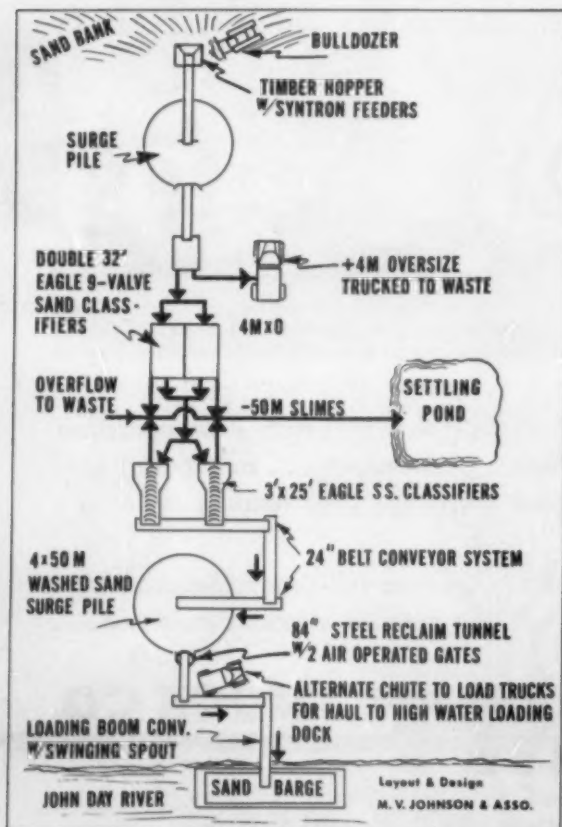
The second deck of the wash screen is no longer in use. It was originally provided to remove a  $\frac{1}{4}$ -in. x 8-mesh fraction and send it directly to storage, by-passing the scalping tank and spiral classifiers, thus effectively increasing the plant's capacity. This was not successful because of blinding on the screen and carryover of slimes. Fortunately, it was unnecessary, since plant capacity has proved more than adequate with no overtime.

All sand passing through the  $\frac{1}{4}$ -in. washing screen is split and distributed to a 32-ft., 2-compartment, 9-valve sand scalping tank. The scalping tank performs three functions: classification, preliminary de-watering, and elimination of slimes.

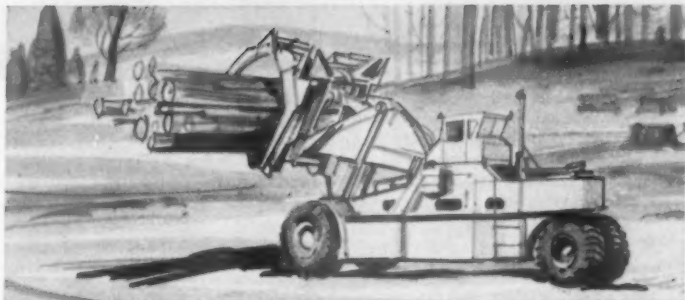
There is a slight excess of particles in the 50 mesh range. The excess 50 mesh sand is bled off from the scalping tank, combined with slimes passing over the weir, and flows to a waste settling pond. Although a sand scalping tank will not make a truly critical classification, in this case it is more than adequate to guarantee that the sand easily

Please turn to page 124

200-tph. sand processing system for John Day Dam. Nearest sand is several miles away on the banks of the John Day River. This calls for barge transportation to bring sand to the aggregates storage system

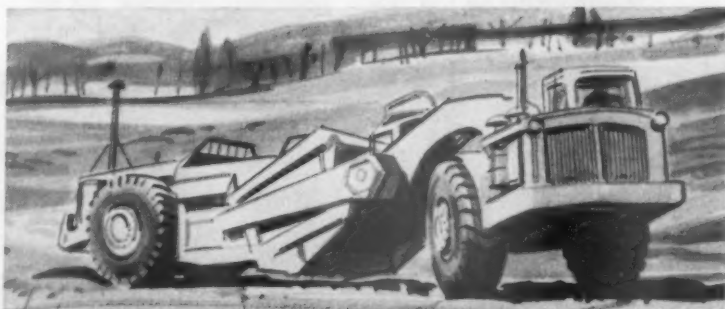


# ALLISON speeds big loads TORQMATICALLY



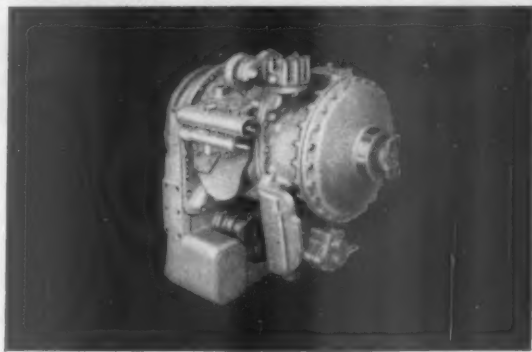
## IN "LUMBER JACKS"

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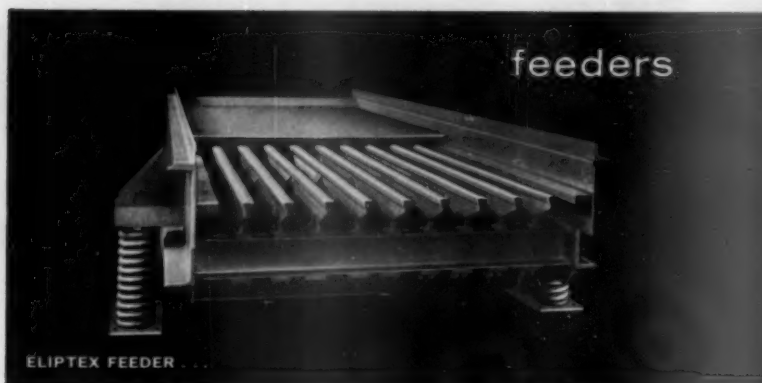
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#### \*HIGH SPEED VIBREX...

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#### VIBRATING CONVEYORS...

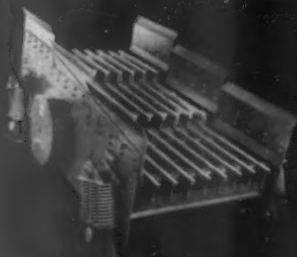
Smooth, dependable conveying of practically any material over longer distances for less cost, because Hewitt-Robins balanced vibration principle uses less horsepower than other makes of similar length and capacity. Sizes: from 8" pan width (light duty) to 48" pan width (heavy duty). Bulletin 135A.

His authority? Over 13,000 Hewitt-Robins vibrating screens, feeders, conveyors and shakeouts are operating in all parts of the world. From this outstanding experience Hewitt-Robins has learned how to design and manufacture vibrating equipment low in upkeep and high in reliability and economy.

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## EQUIPMENT... screens

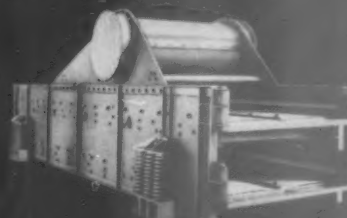
## dewaterizers



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\* ELIPTEX SCREENS AND DEWATERIZERS

Massive, heavy, rugged. Handles 10,000 lb lumps and up to 54" cubes dropped 7 feet at openings from 2" to 14". Heavy grid frames supported on deep section I-beams with cast steel, perforated plate or grizzly bar decks. 1/2" thick 24" high skirtboards. Multiple corner coil spring mounting absorbs impact and vibration. Sizes: from 3' x 6' to 8' x 20'. Bulletin 131.

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With three-way elliptical motion, sizes, washes, dewater a wide range of materials with high accuracy and efficiency. Horizontal installation saves space, power, machinery. Special alloy, forged, self-counterweighted, full-width shafts; premium helical gears; full-floating vibration. Low power requirements. Single, double or triple deck units. Floor-mounted or suspended. Sizes: from 3' x 8' to 8' x 24'. Bulletin 162.

\* All screens available with patented Tension Wedge Outfit. Bulletin D-145.

## shakeouts

## deck preparations



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CAR SHAKEOUTS



DECK PREPARATIONS

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# JOHN DAY DAM . . .

*continued from page 120*



A bulldozer brings sand down from its deposit to the conveyor system supplying the sand plant

meets specifications. Its function as a preliminary de-watering unit greatly simplifies the final de-watering in the two spirals.

Of the remaining specification sand settling out in the scalping tank, the finer fractions go to one 3 x 25-ft. spiral classifier for further classification and de-watering; the coarser fractions go to an identical spiral. Splitting the sand allows a slightly more efficient operation of the two classifiers than if each unit operated on the full size range. The two fractions are re-blended on the belt carrying them to storage.

Originally, the sand screening tower was an open structure. But the unusually high winds common to this area completely disrupted proper settling in the scalping tank and spiral classifiers. Enclosing two sides of the tower eliminated this problem.

Sand is stockpiled near the bank of the John Day River and delivered to the dam site by barge. At low water, loading is no problem. A 24-in. conveyor runs from the storage pile out over the river and barges are loaded through a swing spout at the end of the conveyor. However, at high water barges and tugs are unable to pass under a highway bridge about 1/2 mile downstream.

To get round this difficulty, a truck dump hopper and a second loading conveyor have been placed on the other side of the bridge. By rearranging the sections of the low water reclaim conveyor, trucks can be loaded directly from the stockpile for the short haul to the high water loading point.

At the dam site, barges are now unloaded by a 2-yd. capacity tractor loader. Future plans call for use of a crane equipped with a 5-cu. yd. bucket. Sand travels from the unloading dock to the storage area on a belt conveyor. A tripper on a conveyor distributes sand over the 200-ft. storage piles. Sufficient capacity has been provided for an estimated 25,000 cu. yd. of live storage. Four air-operated swing gates discharge sand to a 24-in. belt conveyor. This conveyor is covered to prevent spillage due to high winds. It deposits sand on the belt leading to the batch plant just ahead of the re-screen tower. The sand reclaim system is also controlled from the batch plant.

Frequent screen analyses are made at the batch plant of all materials to guarantee that they conform to the rigid material specifications required by the project. Sand is analyzed 9 or 10 times per shift, and each size of gravel at least twice a shift.

Peter Kinyon is superintendent of this giant aggregates plant for the contractor, Montag, Halvorson, McLaughlin & Associates. Henry Montag is project manager, while Daryl Mason is general superintendent for the contractor.

Col. H. B. Elder represents the Corps of U. S. Army Engineers as resident engineer.

END

## MAJOR EQUIPMENT REFERENCE

### GRAVEL PLANT

Bulldozers, (2)	Caterpillar Tractor Co.
Vibrating scalping screen 4 x 8-ft. (2)	Nordberg Mfg. Co.
Cone crusher, 4-ft. Std.	
Vibrating screens, 5 x 14-ft. dd. (3)	Hewitt-Robins, Inc.
5 x 14-ft. td. (3)	
4 x 8-ft. sd. (1)	

Conveyor idlers	Syntron Co.
Vibrating feeders, (2)	
Jaw crusher, 30 x 42-in.	Iowa Mfg. Co.
Double roll crusher, 24 x 40-in.	
Multistage pump, 200 hp.	Johnston Pump Co.
Multistage pump, 150 hp.	Peerless Pump Div.
Motors	General Electric Co.
Steel culvert tunnels, 84-in. diam.	Armco Steel Co.
Gravel gates 24 x 24-in. (13)	Murray V. Johnson & Associates
Conveyor belting	U. S. Rubber Co.
Design & engineering	Murray V. Johnson & Associates

### SAND SYSTEM

Bulldozer	Caterpillar Tractor Co.
Vibrating pan feeder, 30 x 72-in.	Syntron Co.
Vibrating screen, 6 x 16-ft. dd.	Hewitt-Robins, Inc.
Conveyor idlers	
Sand scalping tank, 2-compartment, 32-ft.	Eagle Iron Works
Spiral classifiers, 3 x 25-ft. (2)	
Motors	General Electric Co.
Conveyor belting	U. S. Rubber Co.
Tractor loaders, 2-cu. yd. (2)	Clark Equipment Co.
Trucks, 12-cu. yd. (2)	Euclid Div. GMC
Belt tripper, 24-in.	Chain Belt Co.
Multistage pump, 200 hp.	Johnston Pump Co.
Sand gates, 24 x 24-in. (2)	Murray V. Johnson & Associates
Reclaim tunnel, 84-in. diam.	Armco Steel Co.
Design & engineering	Murray V. Johnson & Associates

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Operator can see in all directions, at all times. There are no dangerous "blind spots" to block vision.

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Perfect machine balance permits fast cycles on any terrain, with less danger of over-turning.

### UNSTABLE UNDER LOAD



Improper balance can cause rig to nose-dive or tip sideways — especially on soft ground, bad grades.

### FREE, EASY EXIT

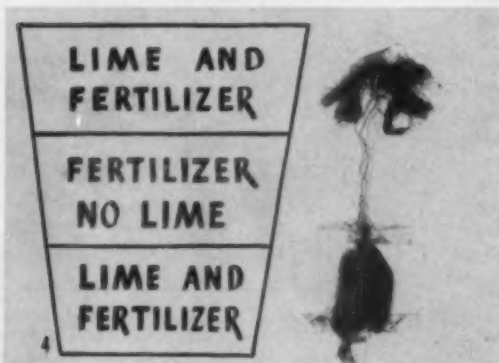
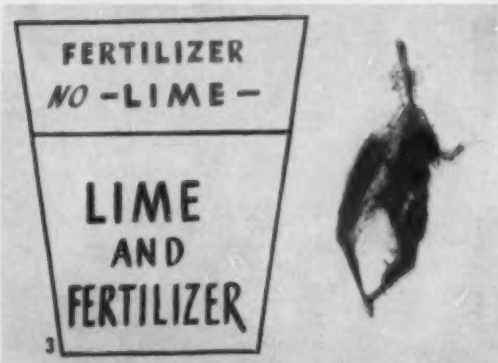
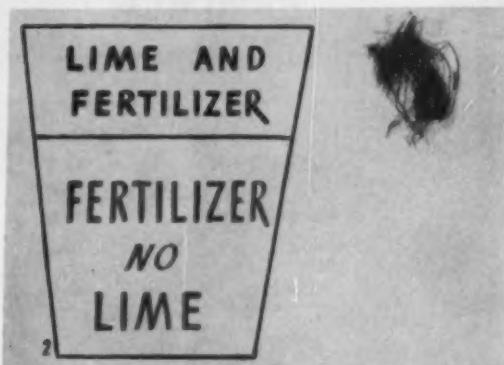


Operator can open cab doors and "bail out" in a hurry — even with lift-arms fully raised.

### OBSTRUCTED EXIT



Operator is "trapped" ... can't open cab doors, or leave machine, when lift-arms are raised.



*Understanding three basic principles  
of liming makes the difference  
between a salesman and  
an order-taker*

## EDUCATION SELLS AG-LIME

by James H. Eakin\*

**T**HE GOOD agricultural limestone salesman is not just an order-taker. He is a man who can help the farmer find a winning combination of ag-lime and good farming practice. A knowledge of three basic principles of liming will be the first step that will answer most farmers' questions and open the door to greater sales. And, of course, the salesman who can keep his answers simple will sell more of his product. Here are the three basic principles that condense some of the volumes written about soil acidity.

Go from the bottom to the top is the first principle. Have the soil tested, then apply all the lime that is recommended—not just part of it.

It is almost as easy to maintain the pH of a well-limed soil as an acid soil. Apply 1 ton per acre of limestone every 4 or 5 yr. on an acid soil and it will still be acid 20 or 30 yr. from today. On the other hand, if a couple of extra tons of limestone are applied in the beginning to move the pH up to the very desirable pH of 6.5 to 7.0, this analysis is almost as easily maintained as the same amount of limestone applied to the acid soil.

This may not seem important until you apply

*Please turn to page 128*

\*Extension Agronomist, Pennsylvania State University, Cooperative Extension Service, University Park, Pa.

**This is the way crimson clover roots looked after they were grown in very acid Westmoreland County, Pa., soil with different amounts of lime and fertilizer**

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## EDUCATION SELLS AG-LIME

continued from page 126

the principle to crop increase data obtained by using the proper amount of limestone over a period of years. For example, we took some data based on the same crop rotations at both pH 5.5 and 6.8. We then figured how much more gross income the pH 6.8 rotation would make over a 28-yr. period. The gross income difference for this period amounted to \$871 per acre in favor of pH 6.8. If it originally took one ton of limestone to reach pH 5.5 and 4 tons to reach pH 6.8, we could say this difference was due to the 3 extra tons of limestone. What a big yield resulted from such a small investment!

**Timing is the second principle.** A very critical time in a crop rotation is the day the farmer "seeds down" to lime-sensitive hay and pasture mixtures. If he does not obtain a good "catch," his cropping system becomes crippled because of low yields over a period of one or more years.

On acid soils, ag-lime must be applied well in advance of the hay or pasture seeding as follows: Apply lime on the sod to be plowed for corn. Next year a second plowing or disking will occur. The field is now ready to be seeded to lime-sensitive legumes.

**Mixing is the third principle.** An acre of soil 6 in. deep weighs about 1,000 tons. For lime to be entirely effective, a few tons of it must be mixed

TABLE I—Pound per acre limestone loss due to:

Crop	Crop Removal	Nitrogen	Leaching & Erosion
Corn	95	180	300
Oats	69	none	300
Alfalfa	384	none	300
Alfalfa	384	none	300
Total	932	180	1,200

uniformly with all of this mass of soil. A perfect example of the results of inefficient mixing is shown by the clover root pictures (see Figs. 3 & 4). Note that the roots did not penetrate any acid soil area even though these areas had received ample fertilizer.

A couple of examples of the importance of soil-lime mixing may clarify this.

Let us remove one ton of topsoil from the 6 in. of topsoil. Let us now apply an equivalent amount of limestone necessary to neutralize its acidity. We could easily hold this amount of limestone in one hand. The job of neutralizing soil acids is difficult simply because we must mix such a small amount of limestone with such a huge amount of soil.

If we topdressed a field of deep-rooted alfalfa, the job of dispersing this limestone throughout the soil becomes very difficult. This can easily be shown as we observe that lime leaches downward only  $\frac{1}{4}$  to  $\frac{1}{2}$  in. every year.

Farmers sometimes complain that they applied limestone last year and a soil test this year shows that nothing happened. Just imagine the soil auger going down through a very shallow area of limed soil  $\frac{1}{4}$  in. deep to pick up 6 or more inches of acid soil below. No wonder the soil test didn't show the soil to be neutral.

Now, let's look at why these are good principles and see why there will always be a good market for agricultural limestone.

Almost everything that man and nature do to soil tends to make it more acid. When he plows the soil, erosion and leaching make it acid. He grows crops and makes it acid. He adds fertilizer and makes it acid. He irrigates the field and makes it acid. He burns coal in his factories and furnaces, and the sulphur in the smoke makes it acid.

Man likes to climb the stepladder to success by jumping on the fifth rung of the ladder and not the first. He seldom thinks that the raw material from which agriculture is made—is soil. And that all roads to successful farming lead back to the soil. When we closely examine the soil we see a wonderfully complex system of roads which seem to find a common junction deep within this

James H. Eakin, Jr., extension agronomist at Penn State University, is pictured speaking at the recent convention of the National Limestone Institute



complex system. We see an organic matter road, a phosphorus, potassium and nitrogen road, a host of trace element roads, and bacterial roads, as well as those traveled by earthworms.

All these roads must be open to the traffic of plant roots, but they all lead to one intersection—soil reaction. In other words, our system of farming in the humid area balances on one "pivot point" which we call the lime status of our soils. This is the great soil and crop regulator. It is similar to the very small pituitary gland at the base of the skull of a human being. If this little gland fails to function properly, so do you.

Let us now examine that fifth rung of the ladder to success. A friend of mine is a seed grower. He is known far and wide as a shrewd man. When he speaks, many people listen. Recently his whole crop of seed wheat on which he had banked heavily started turning yellow. Plant pathologists, entomologists, agronomists and plant breeders converged on his farm to observe this baffling situation. One agronomist took a soil sample although this didn't look like a promising solution. Everyone knew this grower used plenty of fertilizer.

However, the soil test, as is often the case, gave the answer. The pH of his fields ranged from 4.9 to 5.0. This acid reaction is fine for blueberries but, unfortunately, too acid for a 50-bushel-an-acre wheat crop.

This farmer had jumped on the fifth rung of the ladder by piling on ammonium-type nitrogen fertilizers over a period of several years, and ignoring what this would do to his pivot point.

Don't stop using lots of ammonium-type nitrogen carriers. But for every pound of actual or elemental nitrogen derived from ammonium sources, you will need about 1.8 lb. of a high-grade limestone to neutralize the resulting soil acidity. For every pound of nitrogen used from ammonium sulfate, you must use 5.4 lb. of limestone to neutralize its acidifying effects.

Let's use ammonium nitrate, a popular nitrogen fertilizer. When added to soil it breaks down to ammonium hydroxide and nitric acid. The strong nitric acid overpowers the weak base, ammonium hydroxide. When ammonium sulfate is added to soil, we get ammonium hydroxide as well as sulphuric acid.

These same acid-forming reactions occur when anhydrous ammonia, liquid nitrogen, ammoniating solutions used in mixed fertilizers, and urea are added to the soil. All are either ammonia or will break down to form ammonia. Of course, the same thing is true of protein material such as that



Compare this farm operation to one of 20 years ago. This one produces more crops, more milk and more beef per acre. Nitrogen use has tripled. No wonder this farm needs more ag-lime than it ever did before

found in organic matter, bodies of bacteria and manure. These go through the nitrogen cycle, form ammonia with help of bacteria, and the net effect is hydrogen ions or acidity.

How serious is acidity formed by nitrogen fertilizer? The answer depends on how you look at the problem. There is no problem as long as the farmer knows what's going on and watches his lime "pivot point." Farmers should use more of the ammonium-type nitrogen carriers, not less. However, if one looks at my own state of Pennsylvania, the 1959 nitrogen sales show that it would have taken 75,000 tons of high-grade limestone just to neutralize the effect of nitrogen fertilizers. It simply means we should be using more ag-lime, not less nitrogen fertilizer.

Now, what happens to the lime already in the soil? It is removed gradually by both leaching and erosion.

Leaching of calcium and magnesium is mainly dependent on rainfall, soil texture and how much lime was there in the beginning. Carefully run experiments in several states emphasize how difficult it is to give a flat figure for lime removal by leaching. Some states report as little as 100 lb. of calcium carbonate equivalent leached per acre to over 500 lb. each year. In the humid east, a fair round figure might be about 300 lb. of a high-

*Please turn to page 144*

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No. 1 bin with 5' x 12' double deck Scalper and 13-B Gyratory Crusher



No. 2 bin with 5' x 14' triple deck Vibro-King Screen, 48-S Gyrasphere Crusher



No. 3—two 3-compartment bins with a 48-FC Gyrasphere Crusher

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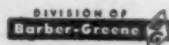


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*The January convention of the National Sand & Gravel Assoc. was a "how-to" meeting for industry. Problems were spread on the table at every session; full discussion revealed several methods of solution*

## NSGA "TALKS OUT" INDUSTRY PROBLEMS

**P**ROBLEMS OF ALL SORTS plague the sand and gravel industry. What they were and how to solve them were well defined in four packed days of discussion at the National Sand & Gravel Association's convention in Bal Harbour, Fla., January 23-26. It was the group's 45th annual meeting, and was held in conjunction with the 31st Annual Convention of the National Ready Mixed Concrete Association.

In one of the most successful meetings to date, presentation of formal papers on a wide range of topics was the general rule, spiced with panel-type sessions and "clinics" that were outstanding in in-

terest and participation. These really got down to basics in analysis and solution to the many problems that arise daily.

Nearly 20 separate problem classifications were put before the convention. About half were operating type, the others non-operating. If an objection to such a king-sized program could be voiced, it would be that it prevented more complete discussion on each subject. In some cases, discussion from the floor was still going strong when the scheduled time limit was reached.

The climaxing papers on the program covered "The Principal Problems—As I See Them" for the sand and gravel and the ready-mixed concrete industries. Both authors searched, analyzed, and came up with a list of problems that will be sure to get more industry attention in the future. Herbert Jahncke of New Orleans, Louisiana, spoke for the ready-mixed concrete industry; Joseph L. Shiely, Jr., of St. Paul, Minnesota, for the sand and gravel industry.

A highlight of the conventions was the joint luncheon on January 25. Featured speaker was V. P. Ahearn, NSGA-NRMCA managing director, who presented his usual well-received analysis of the "Washington Scene."

A special plaque was presented to H. G. Feraud, Southern California Rock Products Association, for his long service in arranging special convention sessions on state and area associations for NSGA. A plaque also was presented to J. L. Shiely, Sr., St. Paul, Minn., making him an honorary member of the associations in recognition for his long and helpful service. *Please turn to page 132*

Joint NSGA-NRMCA boards hold annual meeting at Florida convention



## NSGA MEETING REPORT . . .

*continued from page 131*



Officers of NSGA for 1961, all re-elected (left to right): Harold E. Bender, Azusa, California, secretary-treasurer; E. K. Davison, Pittsburgh, Pennsylvania, president; Fred P. Curtis, Omaha, Nebraska, vice-president

A look at the broad problems of the industry was taken by J. L. Shiely, Jr. He believes that education in several categories is the "big need" of the industry right now. Specifically, Mr. Shiely noted these are the sand and gravel industry's principal problems: (1) Its stake in economic survival of our country. (2) Its management, and lack of understanding by some, of the economic facts of life. (3) Its seeming indifference to public relations. (4) Its slow progress in developing and accepting new production techniques.

Tax problems are perennial in the extractive industries. John Sapienza, counsel for the association, brought members up to date on the legislative and judicial developments in percentage depletion. J. R. Spears of Oklahoma City, Okla., also talked ably on the subject in a later session.

In Mr. Sapienza's opinion, 1960 was a turning point year. For the first time since the principle of depletion was developed, allowances for the industries were decreased in 1960. Congress eliminated the "commercially marketable products" as a base for calculating allowances.

The big question still is whether the Treasury Department will cut back allowances even more. Its January ruling includes as allowable processes "up to and including primary crushing." But the difficulty here is that no one knows exactly what primary crushing is; there's no ruling on sand and gravel yet. If the ruling carries over to that industry, it will have a bad effect on the producer.

Inadequacies in depreciation allowances have been recognized by both parties in Washington,

and that's a plus factor for industry. A bill that proposes liberalization has been introduced into Congress. This example shows how a proposed law may work. If a company shows \$200,000 in annual depreciation and invests \$2 million in capital equipment, that company will receive a percentage of the \$1.8 million to balance against its tax bill that year. It is proposed that the percentage will fluctuate, depending upon the state of the economy; it will go up when an economic stimulant is needed.

You've not heard the last on expense accounts, either, according to Mr. Sapienza. Some Congressmen think the regulations should be tougher. In the works now is a new system for keeping tabs on individual taxpayers. Each may some day have an account number. A large data-processing station will be set up, and district computers will feed that station. Then, if a return has been missed, or an incorrect item shows up, a "red flag" will go up to show the error.

Transportation has worried the association and the industry for many years, particularly railroad freight rates. C. E. Brady of North Carolina pointed out that haulage of sand and gravel has moved consistently away from railroads to trucks. Why? It's the fault of both operators and railroad officials. Large tonnage jobs encouraged producers to open new plants nearer the market, by use of semi-portable equipment. But the railroads continued to try to regulate stationary producers, and their tonnage fell more.

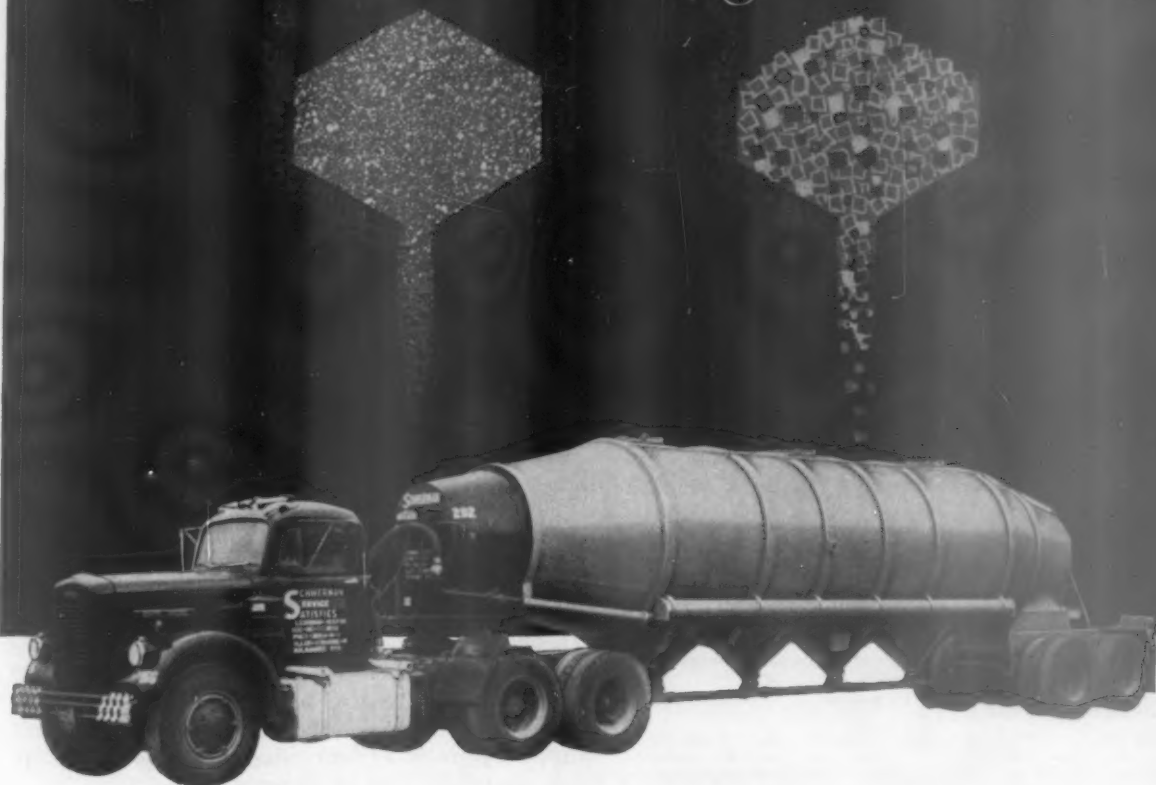
Since interests are paralled, producers will continue to cooperate with the railroads. There's still a chance to convince them that they could and should handle the business, but Mr. Brady thinks it will be a long, hard fight.

There's a campaign to impose tolls or use taxes on waterways, which would affect about 21 percent of NSGA members. Already bills have been introduced into Congress to establish an Inland Waterways Commission and to impose a use tax of 2 mils per ton on waterway users. One expert reported that a tax of 1 mil per ton would be disruptive to business of producers who use waterways. Another company added that a tax of that size would have exceeded its profit for the years 1957 and 1958.

The campaign is being fought by the National Waterways Conference. E. K. Davison, president of NSGA, represents the interests of the association on the Board of Directors of NWC.

*Please turn to page 134*

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ROCK PRODUCTS, April, 1961

133

## NSGA MEETING REPORT . . .

*continued from page 132*

**Sanitary landfills** is one answer to public relation problems. One can also reclaim land and help cities with a garbage disposal problem. Projects in California, in Virginia and in other states were described.

The Virginia project involved depositing 320,000 cu. yd. of refuse in an unsightly excavated sand and gravel area. Refuse was dumped in 12 to 15-in. layers and covered with 6-in. layers of overburden every day. When completed, 10 acres of land were reclaimed, transforming it from an eyesore into an attractive usable area. One California project reclaimed 6 acres of land that now has a valuation of \$25-30,000.

A panel session proposed solutions to many operating problems. Brief informal comments on a variety of problems stimulated discussion.

Small deposits make exploration a sizable problem for many operators. One company keeps a 3-man crew working constantly drilling 7-in. holes



Rock Products trophies go to 1960 safety contest winners. P. D. Allen (left), publisher of Rock Products, congratulates Robert Mitchell and P. W. Gifford (right), whose plants topped all others in Classes A and B, respectively

### National Sand & Gravel Association 1960 Safety Awards

CLASS A: Consolidated Rock Products Co.,\* Irwindale Plant, Los Angeles, Calif.

CLASS B: Gifford-Hill & Co., Inc.,\* Kinder Plant, Dallas, Texas

CLASS C: St. Catherine Gravel Co.,\* Land Plant, Natchez, Mississippi

### Certificate Winners for 5 consecutive accident-free years

American Aggregates Corp., Fort Jefferson Plant, Greenville, Ohio

Cemstone Products Co., Lakeland Plant, St. Paul, Minn.

Concrete Materials & Construction Div., American-Marietta Co., Waterloo Sand Plant, Cedar Rapids, Iowa

Consolidated Rock Products Co., Claremont and Hewitt Plants, Los Angeles, Calif.

Jahncke Service, Inc., Bluff Creek Plant, New Orleans, La.

Lorain Elyria Sand Co., Lorain Plant, Lorain, Ohio

Edw. Lutz Sand & Gravel Co., Inc., Sussex Plant, Milwaukee, Wisconsin

Lyman-Richey Sand & Gravel Corp., Bridgeport, Columbus, Cullom, LaPlatte Railroad and Truck Plants, Omaha, Nebraska

Napco Sand & Gravel Co., Inc., Minneapolis Plant, Minneapolis, Minnesota

Nathan Oaks & Sons, Inc., Oaks Corners Plant, Oaks Corners, New York

Pacific Cement & Aggregates, Inc., Centerville No. 106, Lapis-Prattco Nos. 109-110 and Olympia No. 125 Plants, San Francisco, Calif.

Western Indiana Gravel Co., Anderson, Leesburg and Montezuma Plants, Lafayette, Ind.

\*Winners of ROCK PRODUCTS trophies

on 200-ft. centers, and analyzing 1 out of every 20. Aerial photography and seismograph testing also are being used with good results.

Removal of trash or deleterious material is difficult for many. One river dredging company reported that an upward-current washer is used to remove trash, as well as coal that has a specific gravity of 1.65. Another operator reported that a heavy-media system using silt removes 1.8 sp. gr. coal from sand at 99 percent efficiency.

Log washers, screw-type washers, sand-water pulp systems, jigs, concentrating tables and even air separators either have been or can be used for this type of work. Selection of equipment depends upon the nature of the individual problem. An operator reported the use of double-screw washers that process 125 tph. and remove lignite from sand at 95-97 percent efficiency at a cost of 6¢ per ton.

Jigs and heavy-media systems are used to good advantage in upgrading materials to meet specifications. W. E. Hole, Jr., told of his company's experience with this equipment. The first thing one should know is whether deleterious materials are concentrated in size bands. Sink-and-float tests will give an answer. Then it's important to know the difference in specific gravity between the material to be removed and that to be kept.

When choosing the type of machine to do your particular job, know the operating characteristics of each. Here are some things to remember. Change in rate of infeed will cause trouble, and

*Please turn to page 136*

# NEW LIPPMANN IMPACT BREAKERS

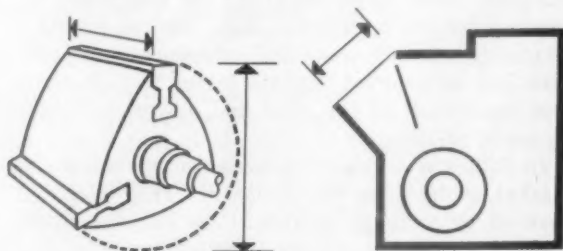
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cut your cost per ton...  
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## NSGA MEETING REPORT . . .

*continued from page 134*

so will insufficient maintenance. Efficiency in the units is better for larger sizes and lower for smaller sizes. Heavy-media units will produce a sharper separation than will jigging. Rough turnkey cost for heavy-media is \$1,000 per ton per hr. of in-feed; similar cost for jigs is \$700.

In screening, look at your scrap pile to see what you've thrown away, to get an idea of your problem. If you're throwing away good metal in your screen cloths, then you'd better look at the cause of breakage or wearing at certain points. In any event, check with your screen cloth manufacturer on proper design of cloth for your particular job.

How about heated screens or those equipped with bouncing balls for better screening of damp materials? Mr. Wylie of Scotland reported that his company has found heated screens necessary in screening small sizes. Another producer stated that he has used heated screens to prevent "growing" of wires for 6 yr. on a gyratory crusher product containing 2 percent moisture. Others reported good results on screening sand containing as much as 10 percent moisture with "bouncing ball" vibrating screens.

If you want to increase screening capacity, it was suggested that you use rectangular holes in the wire or smaller wire itself. Stainless steel screen answers the latter case. Comparing stainless steel screens and regular wire screens, Mr. Wylie stated that experiments showed 10 times the cost and 20 times the life. Others reported life of screens handling 300 tph. increased to 9 months when stainless was used, compared to 3 weeks for regular wire.

**Costs and future planning** cause many producers to have headaches, but the industry is working out good solutions to these problems, too. B. L. Bradley of Nashville, Tenn., thinks that machines should take over cost work 80 percent of the time. And you do not have to be big to use electronic data processing. Mr. Bradley urges you to look into the method if you have 4 employees on record work! It's pretty simple, the way he puts it: When

you do away with people, you do away with problems in cost and accounting work.

How about budgeting and financing? According to A. J. Selzer of Charlotte, N.C., you'll continue to have many bad problems if you don't use the method. The very minimum you should have in the way of prepared statements is a sales forecast, a budgeted operating statement, and availability of cash and cash disbursements statements.

One can't overemphasize the need to know costs. This was the warning of Ken Tobin of NSGA Washington staff, who has done much cost work for the Association. Yet, his experience has proved to him that too many are unaware of basic costs. There are at this time no comparable cost figures for the sand and gravel industry. But Mr. Tobin pointed out that the ready-mixed concrete industry reported, in a 1959 survey, 28 percent of companies had costs greater than income. The study, which covered 30 million cu. yd. of concrete, indicated an average profit of only 4 percent.

The general industry cost and planning picture for the industry was painted by S. M. Berman of Booz, Allen & Hamilton, Chicago, Ill. Like all industry, he noted, the sand and gravel industry is operating in an economic environment that is typed by increasing sales and decreasing profit margins. What to do about it? He suggests: increase sales price, increase sales volume, improve technology, reduce costs and introduce new products. But he believes that the latter two offer the best opportunities for sand and gravel to better its profit position.

In future planning, it is necessary to know the market outlook for the industry. This was well covered by a guest speaker, Cris Dobbins, Ideal Cement Co., Denver, Colo. In brief, he feels that the long range outlook for the cement, sand and gravel and concrete industries is good. For the near future, he believes it will be slow during the first half of this year, improving in the second half and on through 1962. He predicted a gradually increasing volume "in barrels, yards and dollars" for a good many years to come.

*Please turn to page 140*

**Feature of the convention:** the joint luncheon. V. P. Ahearn (7th from left), NSGA managing director, was key speaker



# LE ROI LRD-3

for powerful,  
deephole rotary drilling

Here's the big rig . . . completely self-contained for putting down hole as large as 7 $\frac{3}{4}$  in. to 100 ft. depth!

The LRD-3 is available with either crawler or truck mounting. An enclosed cab can be furnished to provide all-weather protection for the operator while drilling. All controls are conveniently grouped for easy operation and good visibility.

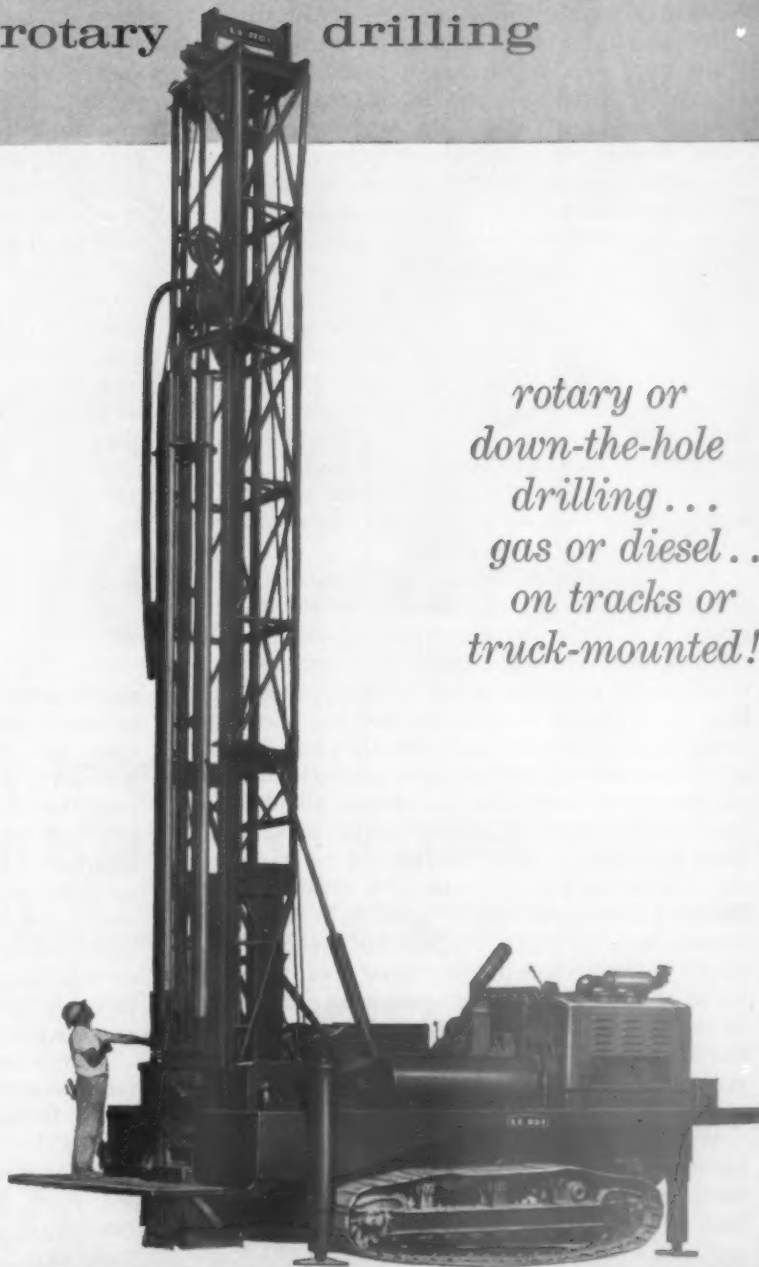
The traveling head design of the LRD-3 provides positive mechanical power without excessive torque loss under heavy pulldown, and permits easy control in making up and breaking down drill pipe. Every function of the unit is designed to speed productive drilling and keep the operator making hole. Leveling, raising the mast, and even the automatic drill pipe magazine are hydraulically controlled for speedy operation. A powerful dust collector traps cuttings and blows them well away from the unit.

An extra-sturdy 4-speed chain-hydraulic pulldown puts up to 30,000 lbs. of pressure on the bit of the LRD-3. A rugged dual-range transmission provides rotary speeds from 9 to 168 rpm in a selection of 10 forward and 2 reverse speeds.

Where needed, the rotary bit can be quickly changed for a powerful down-the-hole drill. A Le Roi 100 hp dual-manifold air compressor provides plenty of 100 psi air for punching through tough rock with the down-the-hole drill, or it can be set to deliver 625 cfm of 40 psi air for fast, efficient removal of cuttings in rotary operation.

The LRD-3 comes complete with a hydraulically operated magazine with capacity for four 20 ft. drill pipes, and can be equipped with such optional equipment as lights for night-time operation, a mounted bit grinder, air hoist, breakout tongs, water injection system, etc. Specification Sheet AT-147 describes the unit in detail, with complete spec information. Send for a copy.

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down-the-hole  
drilling . . .  
gas or diesel . . .  
on tracks or  
truck-mounted!*



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## ROCKY'S NOTES

*continued from page 16*

hydration products, which happens normally within a few minutes. This is hastened, naturally, by sedimentation or settling—"bleeding." (For some obscure reason, bleeding is considered bad. In any other colloidal material, such as in the formation of a natural rock or mineral, it would be considered highly desirable—that is, in the opinion of this commentator.)

The second or dormant period follows, in which our author suggests that a film of reaction products forms around each grain or particle of the cement, but not on it, since he visualizes a film or layer of water between the reactive particle and its enclosing film (primarily hydrated calcium silicate). The process of hydration is slowed because fresh water is prevented from reaching the cement grain. The third period shows an increase of activity and heat evolution, reaching a peak about six hours after mixing. In the fourth period, the activity decreases again to that of the dormant period or even less, showing that the hydration has largely ceased even though the specimens were kept submerged in water.

It is suggested by the author that the dormant period is caused by the sealing off of the cement grains by a film of hydrated calcium silicate, and reaction does not begin again until parts of this film flake off and allow access of more water. This film or membrane is semi-permeable, at least to particles of a definite maximum size, and Powers sees it as passing the hydration products out and passing water molecules in, always maintaining the film of water in contact with the cement particle—what he calls the reaction or transition zone. Here our author states: "A crystal of  $C_3S$  [in the clinker] can hardly be thought of as continuous with its cover of hydration products. The atoms in the surface of the crystal react with water to produce two different molecular species, one of them being crystalline calcium hydroxide, and the other a colloidal calcium silicate hydrate described as tobermorite gel [ $CSF-B$  or  $CaO \cdot SiO_2 \cdot x H_2O$ ]."

We don't see eye-to-eye with him on this point for it would mean that calcium hydroxide and hydrated calcium silicate could exist in contact with each other, in this reaction zone around the clinker particle, and not react with each other. We know that hydrated calcium silicate in the presence of enough lime (calcium hydroxide) will take on, temporarily, nearly all the lime it is exposed to. It would seem more logical to assume that the calcium hydroxide did not separate out until filtered through the semi-permeable membrane which, more likely, held back more of the silicate gel or solution than passed it as our author suggests.

However that may be, there must be an explanation of how the gel and hydroxide are distributed away from the cement grains. Our author says: "It is suggested that the speed-up of reactions, marking the end of the dormant period, is due to a progressive rupturing of the initially formed gel coating, and that the force causing ruptures could be osmotic pressure. The osmotic pressure may be ascribed to the supersaturated state of the solution in the cement gel, the level of saturation being highest in the transition zones between the gel layer and the parent crystals [of unhydrated cement]. As long as such a difference in concentration between the solution in the capillary region [of the gel] and that in the transition zone exists, there should be a tendency for water to leave the capillary region and enter the gel so as to equalize the inside and outside concentrations. If the transition zone is full of water molecules and solutes, the tendency of water to enter will produce pressure which may be called osmotic pressure or swelling pressure. The magnitude of the pressure is a function of the level of supersaturation."

The least understandable part of Powers' theory comes toward the end of his paper in these words: "The hypothesis postulates that substance separates from the parent crystal [of unhydrated cement] to enter a space containing water molecules, and that the substance assumes a mobile state, probably an ionic and molecular dispersion, such that it is able to diffuse out through the gel pores. When the material reaches the region of capillary spaces, there to cause growth of existing gel particles by accretion, or even to nucleate (generate) new particles, there seems to be no essential difference between the process and that designated as solution and precipitation, except for the interval between the time an ion leaves the crystal and the time it is able to precipitate."

This is confusing because the author has already stated that the hydration products are colloidal throughout the process, and he now discusses the movement of ions through the semi-permeable membrane of hydrated calcium silicate gel. Here, we think, he has gone astray in his reasoning, and that the hydration process is much more akin to that now accepted as cause of alkali-aggregate reactivity and subsequent swelling in concrete. We can see, from the point of view of colloidal chemistry, little difference in the mechanics of the hydration of a cement particle and the hydration and expansion of a piece of reactive aggregate. In one case, we are dealing primarily with calcium hydroxide, and in the other with

*Please turn to page 140*



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**TL 10**

2-wheel drive  
3,600-lb carry capacity



move ahead with **ALLIS-CHALMERS**

... power for a growing world



## ROCKY'S NOTES

*continued from page 138*

sodium hydroxide; but both have the faculty of dissolving (in a colloidal sense) silica or silicon dioxide. This silicate forms a semi-permeable membrane about the particle, be it cement or reactive aggregate. The theory that best explains the swelling pressure in the case of the reactive aggregate is that the membrane permits water molecules to enter, but prevents the semi-fluid silicate from leaving—hence, the osmotic pressure which disrupts the enclosing concrete.

Moreover, it has been shown in the case of a

reactive aggregate that if it be finely ground (pozzolan, for example), the process of dissolving the silica or silicate, and distributing it through the matrix, very much improves the quality of the mortar or concrete. However, the assumption still is that this is done by osmotic pressure pushing the hydrated silicate gel away and into the capillaries or pores of the gel, not by distributing it through the semi-permeable membrane surrounding the reactive particle; for if it did, osmotic pressures would not build up. **END**

## NSGA MEETING REPORT . . .

*continued from page 136*

Research problems of the industry were discussed by D. L. Bloem of the NSGA Washington staff. In back of research problems is the fact that the industry is being squeezed between two opposing forces. Good deposits are being depleted and possible use of others is being cut off by urban encroachment. Yet, there's a simultaneous demand for improved quality, performance and versatility

in products made. Competition of substitute materials adds to the squeeze.

There are two ways to get relief: the industry must make better use of the materials it has, and it must give more attention to improving quality of materials now considered unsatisfactory.

This general situation suggests a wide array of research problems. Some of them have been pursued by the association and others are on the list for future work. Mr. Bloem's paper included a brief review of the role research has played, and can be expected to play, in broadening the market and improving the performance of sand and gravel. He believes that there should be a more realistic and quantitative evaluation of the relation between performance—strength, durability, volume change, etc.—and grading, shape, size, texture and elastic properties.

Not all of this required work can be done in a single laboratory, but the association's work will continue to contribute substantially, as it has in the past.

Distinguished guests at the Florida conventions included Col. H. E. Peirce, chairman, Sand & Gravel Association of Great Britain, London, England, and W. H. Wylie, chairman, Alexandra Transport Co., Ltd., Glasgow, Scotland. Mr. Wylie also contributed to the convention program.

The 1962 annual meeting of the Association will be held in Chicago, Ill., Feb. 5-9, in conjunction with the biennial equipment show. Exhibits and convention sessions will be held in Chicago's new McCormick Place on the lake front. The 1963 annual convention is scheduled for San Francisco, Calif., Feb. 11-14.

Officers of NSGA for 1961 include E. K. Davison, president; Fred P. Curtis, vice president, and

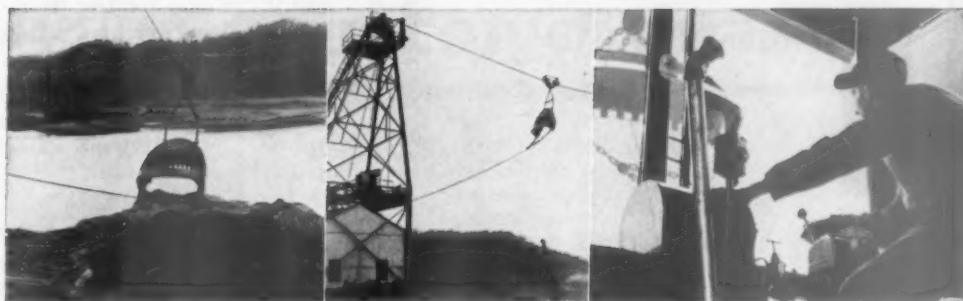
*Please turn to page 142*



# These Special Excavating Jobs Are Best Handled by Sauerman DragScrapers

## Deep Digging

900-FT. SPAN—  
65 FT. BELOW  
WATER...



Load is deposited by tensioning the track cable, thus lifting the DragScraper from the pile. Tensioning continues to the desired height for releasing the DragScraper and returning it by gravity to the pit.

Operator controls digging and hauling from cab in head tower.

"the 10-yd. DragScraper is doing a wonderful job and we could not operate without it..."

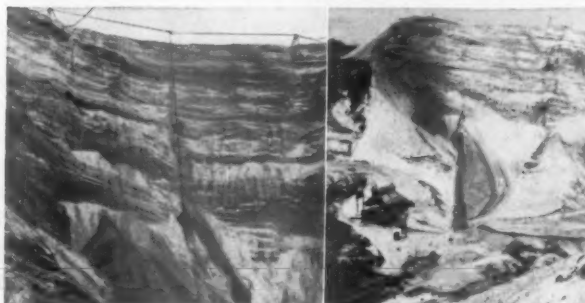
Louis Chinelli, Gen. Supt.  
Redman Concrete Corp.

Redman had been trucking material at a cost of \$35,000 a year to the location where the DragScraper is now placing it. The 10-yd. Sauerman covers a pond area of 1500' by 3000' and is digging 40 ft. deeper than their previous dragline could operate.

The DragScraper digs and hauls on a 900-ft. span. It operates between a 90-ft. fixed head tower and a 40-ft. mobile tail tower which may be shifted to change the line of operation. The company's 1000-yd.-per-day batch plants and its fleet of mixers and trucks are kept busy by the steady flow of material supplied by the DragScraper.

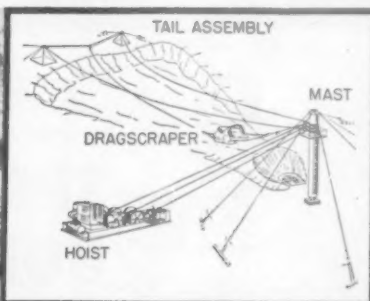
## High Bank Digging

175 FT. HIGH—  
600-FT. HAUL...



DragScraper digs from high bank.

Overall view shows height and steepness of bank. Diagram shows details of Sauerman installation.



"I have nothing but praise for our 4-yd. Sauerman Machine. Since the DragScraper began operations in 1952, we have worked it continuously 12 hours a day..."

John D. Robertson, Gen. Supt.  
Chandler's Palos Verdes  
Sand & Gravel Co.

By working down from the top of the 175-ft. bank, the material flows ahead of the DragScraper. This provides bonus loads on each haul and substantially lessens the danger of cave-ins.

Operating cables are powered by a Sauerman three-drum electric hoist. Equipped for rapid shifting, the DragScraper can be quickly positioned to any line of operation between the two tail towers at the top of the bank and the headpost at the hopper.

The plant is the largest sand producer in the South Los Angeles area and, together with two ready-mix plants, keeps 22 ready-mix and 18 dump trucks busy.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Consult Sauerman engineers about your plant. Their recommendations

will be based on fifty years of excavating machinery experience. Ask for Catalog A (DragScrapers). Sauerman News Nos. 149 and 150 describe the above installations in greater detail.

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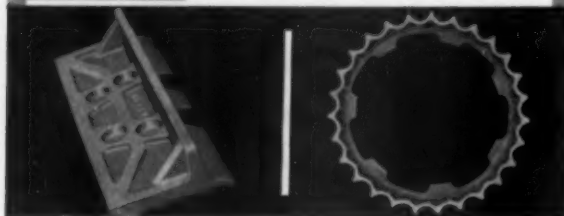
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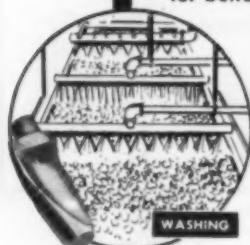


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concrete curing

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- complete choice of types and capacities to fit your job
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Proper distribution and impact for washing... or proper atomization for dust control and concrete curing without unnecessary wetting... these are just some of the advantages of having a complete choice of spray nozzle types and sizes to fit your job. For complete information write for Catalog 24.

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## NSGA MEETING REPORT . . .

*continued from page 140*

Harold E. Bender, secretary-treasurer. All were re-elected.

Elected officers for the Manufacturers Division, NSGA, to serve during 1961, are: John E. Dunn, Allis-Chalmers Mfg. Co., Milwaukee, Wis., chairman; Harry F. Lawrence, The W. S. Tyler Co., Pittsburgh, Pa., 1st vice chairman; Herbert J. Knudten, The Universal Engineering Corp., Cedar Rapids, Iowa, 2nd vice chairman; K. F. Lange, Link-Belt Co., Chicago, Ill., 3rd vice chairman, and John S. Carr, American Manganese Steel Div., American Brake Shoe Co., Chicago Heights, Ill., 4th vice chairman. Mr. Dunn passed away unexpectedly in February, and Mr. Lawrence has assumed the responsibilities of chairman. **END**

## WILL CONGRESS RESOLVE . . .

*continued from page 83*

tion to the basic conflict in the philosophy of financing the interstate program.

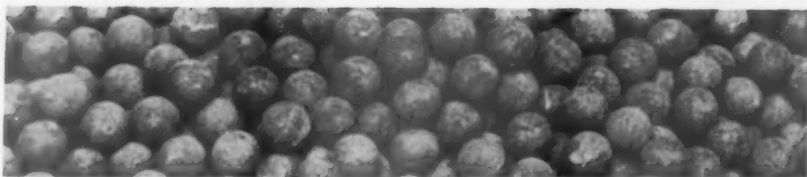
Without exception, the people with whom I talked at the Bureau of Public Roads said, in effect: "We have been asked to prepare three fact-finding studies on the interstate highway system. This we have done, and all three will soon be in the hands of Congress. It is not our job to interpret the data in the form of recommendations for a new financing program. This is the job of the appropriate Congressional committees, working from the facts we have assembled."

But when I questioned interested Congressmen on this point, they took the position that it is the responsibility of the executive branch of the government to work up a specific program which Congress then can consider either for passage or for modification.

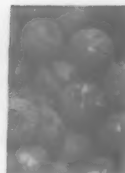
Rep. Boggs told me: "It's up to the administration to decide what it wants to do about the interstate highway muddle. Until the administration sends down a specific program, we can do nothing."

These, then, are the problems facing national legislators to spur our interstate highway program. These, also, are the problems that will be discussed in considerably greater detail in the articles to follow in this series.

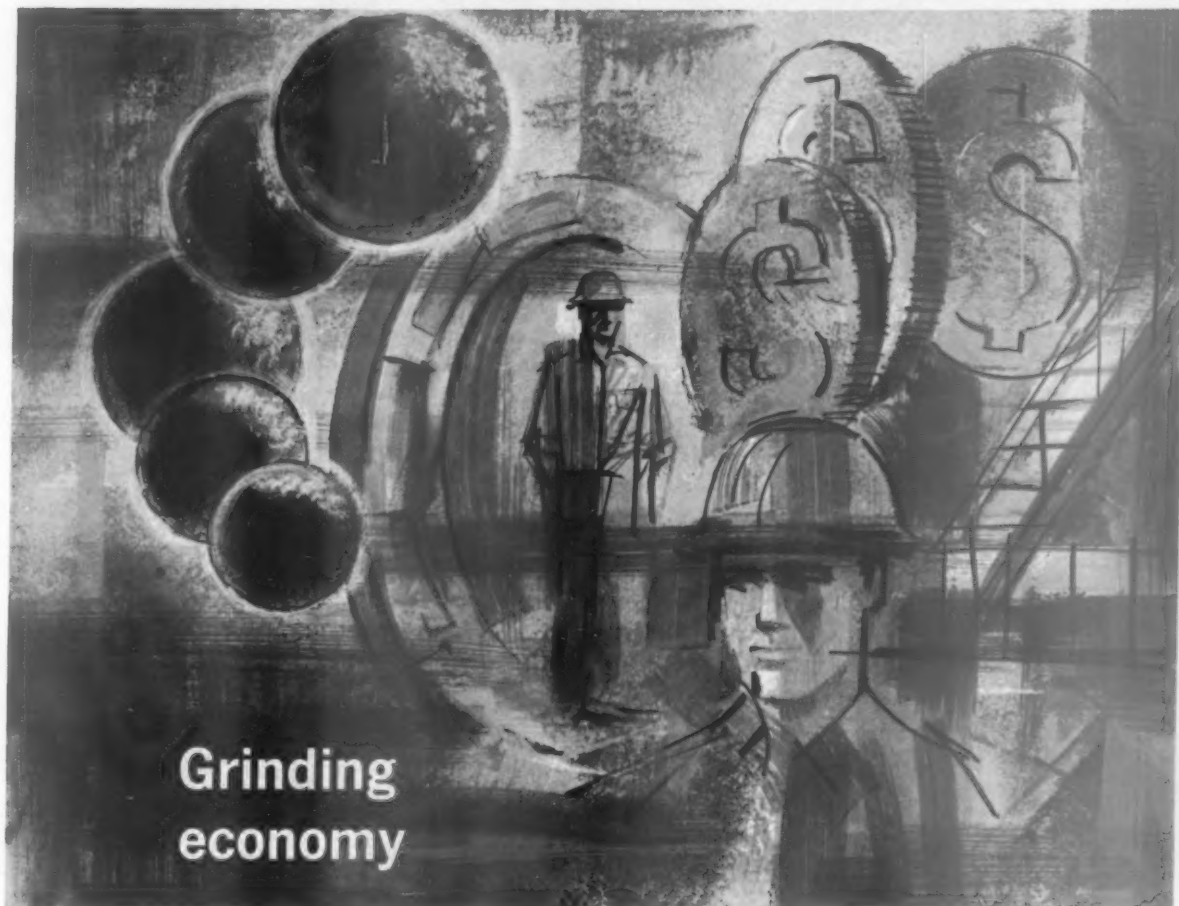
The interstate highway program that everyone seems to want is in financial trouble. When it will be re-energized—and in what form—is still an imponderable, and it may continue to be for a considerably longer period of time than either rock products producers or the nation's motorists would wish. **END**



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## EDUCATION SELLS AG-LIME

*continued from page 129*

grade limestone having a calcium carbonate equivalent of 95, lost by leaching and erosion.

Leaching goes on regardless of almost anything you can name. However, crop removal changes from year to year. But as agricultural technology improves, crop removal becomes greater. As we produce higher yields per acre, crops remove a greater amount of calcium and magnesium.

There is a lot of honest disagreement, or at least difference, as to how much lime a bushel of corn or a ton of alfalfa removes from the soil. This is mainly because the calcium and magnesium level of plant tissue varies just like phosphorus or potassium levels vary. This means we should settle on some standard crop removal figures and use these to demonstrate lime loss.

It is possible to demonstrate the calcium and magnesium losses to farmers. Here's a good way to explain how necessary it is to use ag-lime.

Let us use an example of a 4-yr. loss using a rotation such as corn—oats—alfalfa—alfalfa. We will use 100 lb. of actual nitrogen fertilizer applied in the ammonium form for the corn. Let's grow 100 bushels of corn, 60 bushels of oats and 4 tons of alfalfa each year.

Table I is figured on the loss of high-grade limestone (95 percent calcium carbonate equivalent). This loss or removal would amount to 2,312 lb. of limestone per acre, each 4 yrs. To maintain a soil at pH 6.5 to 7.0 in this example, we should apply more than one ton of high-grade ag-limestone every 4 yrs. for maintenance purposes. It is also easy to see how these loss or removal figures could be less or more than the example.

The good ag-lime salesman must realize that while his potential market is expanding, the number of his prospects is diminishing.

During the past 5 yr., Pennsylvania lost one farm every 76 min., about average for the United States. While the number of farms is decreasing at a fast rate, those that remain are getting larger. It becomes increasingly difficult for any farmer to remain solvent, let alone prosperous.

But the tonnage of ag-lime used each year does not have to decrease just because we are losing numbers of farms. This is due mainly to the fact that we are still selling only 30 to 40 percent of our annual needs for lime. Ag-lime will not alone keep farmers in business. It takes more than lime or fertilizer or good seed. For the individual farmer, it will require the combining of all his available resources such as land, labor and capital into an efficient operation.

END

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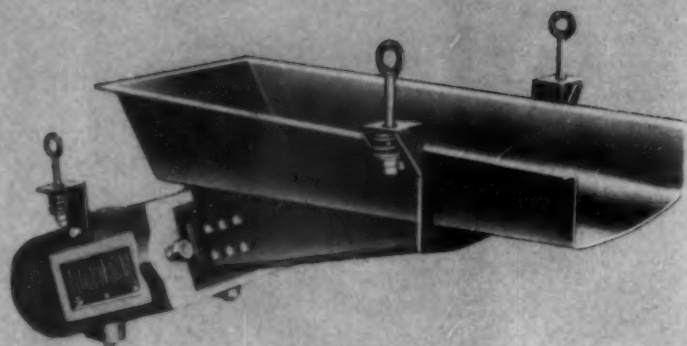
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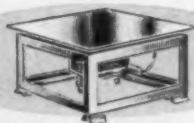
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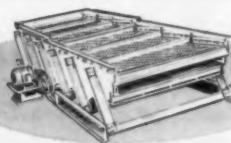
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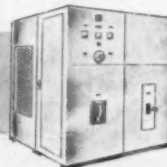
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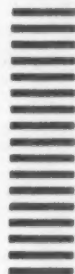
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# In Cement and Aggregates the Word for Air Separation is "Sturtevant"



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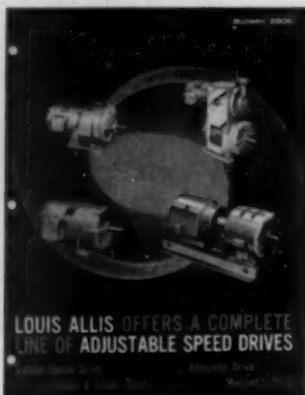
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## NEW LITERATURE

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue

### Adjustable-speed drive line

THE LOUIS ALLIS CO. has issued a bulletin that outlines the company's extensive line of adjustable-speed drives for applications in the  $\frac{3}{4}$  to 2,500-hp. drive range. The bulletin describes four types of complete-packaged, adjustable-speed drives and gives details on available ratings, speed ranges, type enclosures, associated controls and many standard and special modifications.



The line includes: ac. drives for stepless, accurately controlled adjustable speed over a 17:1 speed range in ratings from 1 to 100 hp., with larger ratings available in liquid-cooled types featuring an 8 to 1 speed range in ratings up to 2,500 hp. Also included are dc. drives for adjustable-speed performance over an 8 to 1 range and greater in ratings from  $\frac{3}{4}$  to 400 hp., and an ac. motor-driven, mechanical adjustable-speed drive (disc and belt) for speed ranges of 8 to 1 in ratings from 1 to 20 hp.

Enter 700 on Reader Card

### Processing equipment

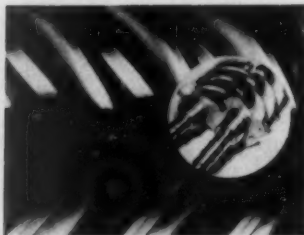
DENVER EQUIPMENT CO. has published an 8-page bulletin containing photographs and specifications of 44 different items of the company's equipment for the mineral and chemical processing industries. Descriptions of laboratory testing service, engineering

and mill design services are included.

Of particular note in this bulletin are three new items that the company is manufacturing. One is a pump which is designed for installations where dilution of pulp with sealing water is prohibited. The pump has no packing, no gland and does not dilute the pulp with sealing water. The laboratory flotation machine is three machines in one, being capable of performing laboratory flotation tests in one machine that previously required three different units. The other unit is the attrition machine that operates with a pulp density at 70-80 percent solids to clean and polish sand by grain-to-grain attrition.

Enter 701 on Reader Card

### Rotary compressor



FAIRBANKS, MORSE & Co. has made available a bulletin that describes a heavy-duty rotary compressor for general-purpose services, including those requiring delivery of oil-free air, gas or vapor. The illustrated bulletin also lists performance coverage—capacity up to 21,000 cfm. and pressure up to 250 psig.

Enter 702 on Reader Card

### Diesel engine catalog

ALLIS-CHALMERS MFG. CO. has made available an 8-page catalog that describes the company's recently introduced diesel engines. Performance curves and charts, and illustrations, including cutaways of important components, are included. These engines are in the 100 to 210-hp class.

Enter 703 on Reader Card

(Continued on page 153)

**REACH  
AND  
DUMP  
HEIGHT  
LIKE  
THESE**

**PUT  
MORE  
IN THE  
TRUCK  
AT  
LOWER  
COST**



New ML-309 "Moto-Loader"<sup>TM</sup>  
designed to your specifications.



An ML-309—18,000 lb. lift capacity—equipped with a 3-yd. bucket loads out rock at the Lincoln Stone Quarry, Joliet, Illinois.

Before Lorain engineers put pencil to paper to design this latest Lorain Moto-Loader, users were surveyed to find out the features most wanted in a machine of this class. Maximum dump height and forward reach at that height were high on the list.

Lorain came through. Dump height of the ML-309 is 10' with 16x24 tires, 10'x3" with 18x25 tires. Forward reach at 10 ft. dump height is 3'6".

It is here, where the work is done, that the Lorain ML-309 pays off; lets you load the big, high trucks fast and efficiently, with an even spread, for maximum profit.

Of course, there are many other fine features in the ML-309. A few are:

**4 speeds and full power shift** with Lorain's "Moto-Matic" simplified and easy-to-service transmission.

**"No hands" forward and reverse.** One foot controls travel directions and speeds—frees hands for other operations.

**Safety arms.** Never a hazard. Excellent side vision.

**One piece full-depth frame** of heavy, welded sections won't deflect or twist.

**New bucket design** produces boiling action that fills even in the back corners; produces proper crowning for non-spill carry.

There are many more that can be described by your nearby Lorain Moto-Loader distributor. And ask him for a demonstration. Stack up the "309" against anything in its class. This is the real way to find out how all Lorain features are "balanced" for maximum production.

**THE THEW SHOVEL COMPANY, LORAIN, OHIO**

**LORAIN<sup>®</sup>**

**Does more, faster, for less**

**PLANTS** in Lorain and Elyria, Ohio.

**PRODUCTS**—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from  $\frac{3}{8}$ - to  $2\frac{1}{2}$ -yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 11,000-lb. to 18,000-lb. lifting capacity.

**OUTLETS**—Lorain products sold and serviced by 249 distributor outlets throughout the world.



**VICTOR**

for hardfacing

## **NI-MN RODS**

*for build-up  
for attachment*

**Victor Ni-Manganese for Build-up** is 4½% nickel, 13% manganese alloy, specifically developed for rebuilding manganese steel parts such as bucket teeth and lips; rail frogs and switches; crusher, dredge, pulverizer components. May be used as finish build-up or underbase; forms sound, slag-free welds; high deposition rate and good weldability. Deposits are austenitic with full Hadfield steel properties; non-magnetic, tough and ductile; stands roughest abuse. Made in 5/32", 3/16" and 1/4" diameters; bare, for manual application by DC, reverse polarity.

**Victor Ni-Manganese for Attachment** welds crack-free, is specially recommended for difficult joining applications on manganese or carbon steel castings, such as: Dipper teeth and lips; track and drive sprockets; dragline pins and links; rail crossovers, switches and frogs; rolling mill parts; crusher screens, hammers, rolls and mantles; dredge parts. Deposited metal is extremely tough, wears well, has high impact strength. It's a wonderful, low-cost substitute for "stainless" where joining rather than corrosion resistance is chief factor. Made in 1/8", 5/32", 3/16" and 1/4" diameters for manual application by AC or DC, reverse polarity.

For all your hardfacing or welding needs, call your Victor dealer. Order Victor Ni-Mn rods today.

*Profitable dealerships open; inquire now!*

**VICTOR EQUIPMENT COMPANY**

Alloy Rod & Metal Division

H-65

13808 E. Imperial Highway, Norwalk, California . . . . . Wakita, Oklahoma

## NEW LITERATURE

(Continued from page 150)



### Grizzly feeder bulletin

CHAIN BELT CO., Carrier Div., has published a bulletin describing its natural frequency vibrating grizzly feeder line. These grizzly feeders are designed primarily for use in rock products and ore processing plants. They are also used with crusher or hammer mill operations to feed rock of any size at uniform rates; distribute material evenly across opening for uniform crusher wear; scalp fines to prevent crusher jamming, and to automatically control capacity for crusher efficiency. The bulletin describes the grizzly's amplifier drive that uses natural frequency. It also outlines the advantages of the company's remote control system.

Enter 704 on Reader Card

### Lightweight plaster aggregate

PERLITE INSTITUTE, INC. has made available to contractors, architects, engineers and builders, the 1961 issue of the Perlite Lightweight Plaster Aggregate Catalog. It describes in detail specifications for the aggregate plaster covering materials, basecoat, recommendations, finish coat application as well as mix proportion, thermal conductivity and sound reduction data.

Enter 705 on Reader Card

### Alloy steel castings

ALLOY STEEL & METALS CO. is offering a bulletin that covers design advantages and engineering properties of the company's alloy steel castings, plus welding and machining data. Plate bar, tubular and forged products of constructional alloy steel are used for their strength, toughness and weldability. Now steel castings offer design engineers these same advantages.

Enter 706 on Reader Card  
(Continued on page 154)

Enter 1460 on Reader Card



## make it last — make it LESCHEN

The man who uses wire rope knows that Leschen quality and service give best results—that Leschen Wire Rope keeps production on the move—that Leschen will make sure it's the right rope for his need. • To be safe and sure call your Leschen distributor for expert advice on your wire rope needs. For further details and literature, write Leschen Wire Rope Division, 2727 Hamilton Avenue, St. Louis 12, Mo.



# PORTER

**LESCHEN WIRE ROPE DIVISION**  
**H. K. PORTER COMPANY INC.**

Porter serves industry with steel, rubber and friction products, asbestos textiles, high voltage electrical equipment, electrical wire and cable, wiring systems, motors, fans, blowers, specialty alloys, paints, refractories, tools, forgings and pipe fittings, roll formings and stampings, wire rope and strand.

Enter 1461 on Reader Card

ROCK PRODUCTS, April, 1961

153

## QUICK-CHANGE "ARTISTS" LOVE THAT "TELLTALE" PUMP



**NEW Type D-T  
Heavy-Duty  
"TELLTALE"  
Centrifugal  
Sand and Gravel  
PUMP**

**CHANGING TIME**, depending on the men: 6" impeller, 1 to 1½ hours; 8", 2½ to 3 hours. —6" impeller, shell liner and both faceplate liners, 2½ to 3½ hours; 8", 5 to 8 hours. It's the simple, foolproof assembly that is "Telltale's" own.

**AS LOW IN DOWNTIME AS IT  
IS HIGH IN PRODUCTION**

"Telltale" is the only pump that warns when it's time to reline. Air sucked through periphery ports causes pump to lose its prime. Pumping stops. Water leaking through the ports signals that the shell liner and the surrounding belt of packing have worn through.

Available with either tough semi-steel or best-in-the-long-run Ni-Hard wearing parts in 4", 6", 8", 6 x 8" suction and 8 x 10" suction. Now available also in either alloy, 45 and 90° extra-heavy long-radius flanged elbows. Write for Type D-T Heavy-Duty folder and prices.

## PEKOR IRON WORKS, INC.

ESTABLISHED 1892

FAIRFAX 2-4020

COLUMBUS, GEORGIA

LOCK DRAWER 909

Enter 1465 on Reader Card

## **S&H** "ORIENTED" DIAMOND BITS

**BITS BY ANY OTHER  
NAME ARE NOT THE SAME**

Because:

1. The diamonds are "Oriented", which means that the hardest vector of the stone is set toward the work.
2. The diamonds are of uniform quality and size.
3. There is a wide choice of matrices offering you a bit suitable for any drilling condition.
4. S&H bits are manufactured using modern heat treatment methods, quality control, and with a critical inspection before shipment to customers.

S&H "Oriented" Diamond Bits are available in all standard sizes and a wide variety of special sizes and types.



Look for our emblem... It's your Seal of Quality

**SPRAGUE & HENWOOD, Inc.**

SCRANTON 2, PA.

MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.



New York • Philadelphia • Nashville • Pittsburgh • Grand Junction, Colo. • Tucson • Suthans, Nfld.  
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N.Y.

Enter 1466 on Reader Card

154

ROCK PRODUCTS, April, 1961

## NEW LITERATURE

(Continued from page 153)



### Business operating ratios study

DUN & BRADSTREET, INC. has published "14 Important Ratios in 72 Lines of Business," a comprehensive annual study of operating ratios averaged from a wide sampling of retailers, wholesalers and manufacturers. The ratios, which have been offered by the company to the business community yearly since their origin in 1931, are utilized by business men as a yardstick in measuring the performance of their businesses with others. Credit and collection personnel also utilize the ratios to understand trends in their field.

For the first time in a single source, the ratios are complemented with text fully detailing their usage and meaning, how they are compiled, as well as how they may be interpreted.

Enter 707 on Reader Card

### Price list for rock bits

VAREL MFG. CO. has issued a new price list for its line of rock bits. This new price schedule affects primarily small sized bits from 2½ through 5¼ in. and these prices will be applicable on all bit orders shipped and billed on or after Nov. 1, 1960. These are all domestic list prices and for export purchases in quantities.

Enter 708 on Reader Card

### Buell bulletin

BUELL ENGR. CO., INC. has recently issued a 4-page bulletin describing its complete line of dust collecting, recovery and classifying equipment. Air pollution, material handling and classification, recovery of material from waste gases, and employee comfort are a few of the areas of application for the company's equipment.

Enter 709 on Reader Card

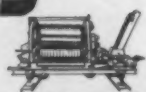
(Continued on page 157)

## GRINDING COSTS PER YARD GO DOWN

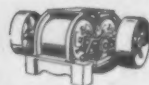
When you install the American #9 Grinder in your plant for the reduction of lightweight aggregate, cinders, haydite, pumice, slag or other mine and quarry products. Owners report over 30 yards per hour and maintenance costs of less than 1¢ per yard. It grinds wet or dry material with no screen plates required. Suspended mullers are adjustable to volume and size requirements. Heavy-duty construction assures years of trouble free service. Get all the facts on the #9 soon—lower costs mean greater profits.



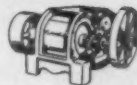
**American**  
CLAY MACHINERY



ELECTRIC CUTTERS



SMOOTH ROLL CRUSHERS



DISINTEGRATORS



PUG MILLS



GRINDERS

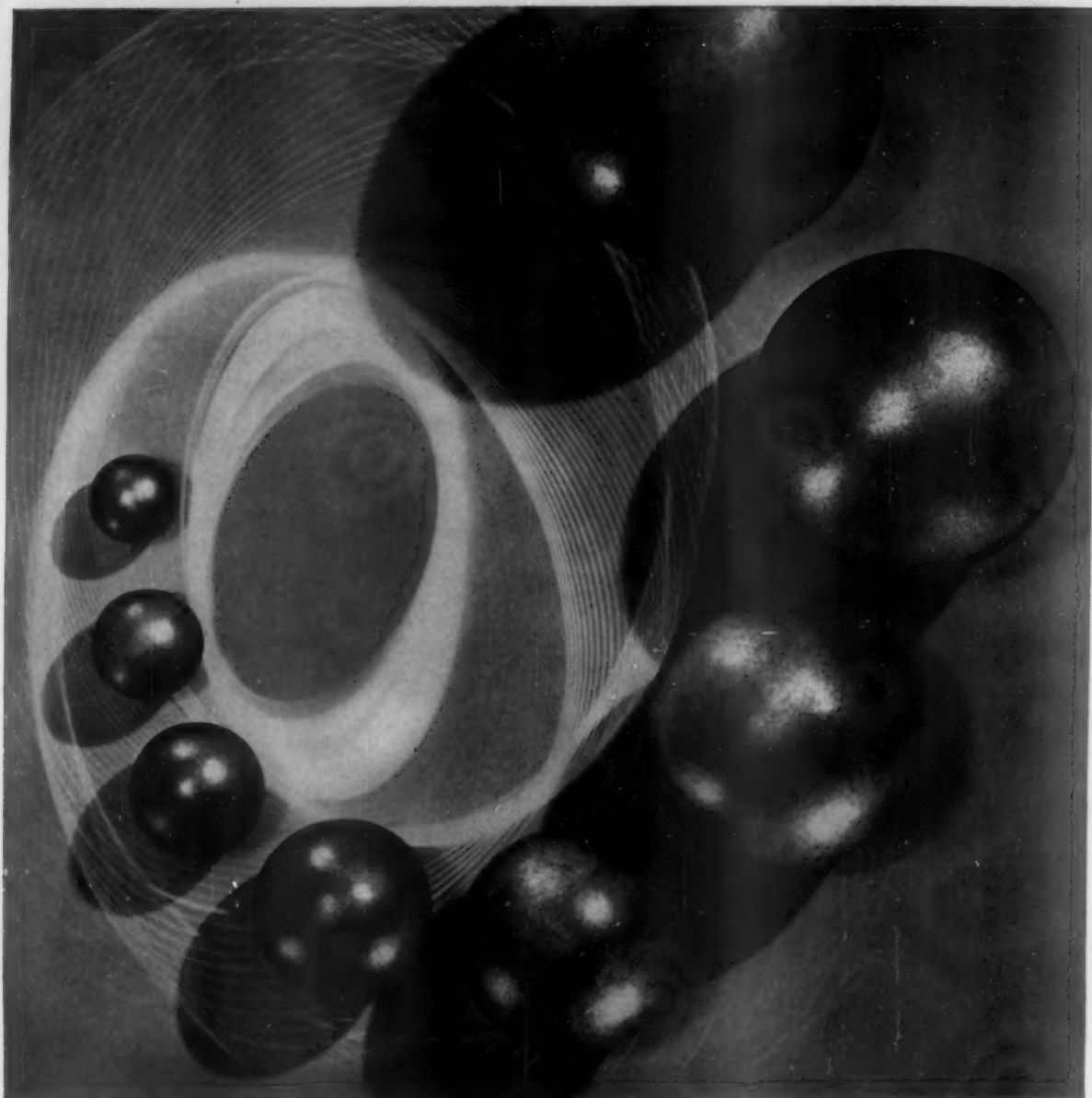


DE-AIRED  
COMBINED MACHINES

DIVISION OF

HUBER-WARCO COMPANY - Marion, Ohio, U.S.A.

*Do Your Job  
the AMERICAN way*



## CF&I controls grinding ball quality all the way

As an integrated manufacturer, CF&I has an opportunity to exercise careful quality control at every stage of grinding ball manufacture, from the mine to the finished product.

The result is forged alloy and carbon steel balls that have outstanding hardness (resistance to wear), toughness (resistance to impact splitting), uni-

formity of roundness and uniform density. These uniform physical properties mean better milling results for you—the user.

CF&I Grinding Balls are available in the following range of sizes: Forged Alloy Steel Balls—1½" to 4" in diameter; Forged Carbon Steel Balls—¾" to 5" in diameter.

Other quality CF&I Steel Products for The Cement Industry  
Grinding Rods • Mine Rails and Accessories • Rock Bolts • Reslock  
Metallic Fabric • Industrial Screens • Wickwire Rope • Grader Blades

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The Colorado Fuel and Iron Corporation  
Denver • Oakland • New York  
Sales Offices in All Key Cities



## ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.



## CLOGGED BINS A PROBLEM?

If troublesome slowdowns caused by sticking, arching, stubborn materials are your problem, here's good news:

Eriez Hi-Vi® electro-permanent magnetic Unit (Bin) Vibrators are your answer. They've proven superior time and again for dependable movement of stubborn masses of granular, lumpy or powdered materials in bins or hoppers.

Their concentrated vibration is directed to deliver maximum efficiency precisely where it is needed. The full Hi-Vi line offers models for use with all sizes of bins with wall thickness to 1/2" — Special models are available for hazardous, dusty locations.

All models bring you these advantages.

- Direct AC operation — no need for rectifiers.
- Lower operating and maintenance costs.
- Compact, light-weight, easy to install.
- Weather-and-dust-resistant housings at no extra cost.
- No sliding or rotating parts.
- No wear, no lubrication.

Get the Hi-Vi unit that's exactly right for your operation. Full technical data is available in our new bulletin. Write for it to:

**ERIEZ MANUFACTURING CO.**  
202RA Magnet Dr., Erie, Pa.



**MAGNA-THOUGHT**  
The manufacturer who does the most for his customers is the one who is qualified to provide application know-how as well as superior products.

*Wm. H. Henkin*  
Wm. H. HENKIN  
Supervisor Vibration Engineering



Enter 1467 on Reader Card

## NEW LITERATURE

(Continued from page 154)



### Belt engineering for industrial bucket elevators

HEWITT-ROBINS INC. has issued a 22-page booklet on industrial bucket elevators for the handling of bulk materials. The booklet contains engineering data on various types of bucket elevators and recommends the grades of belting best suited for elevating materials of different weight, abrasiveness and temperature.

One section deals with belt selection procedures based upon formulas developed over many years' experience in the design of elevators. Another section presents statistical tables on steel elevator buckets. There are also sections on trouble-shooting and belt splicing.

Enter 710 on Reader Card

### Wheel loader catalog

CATERPILLAR TRACTOR CO. has issued a 12-page illustrated booklet that details the design features of the company's wheel loader. The engineering details which assure response performance, operator safety and convenience, ease of servicing and versatility are described at length in the booklet. Also included are complete specifications for the unit.

Enter 711 on Reader Card

### Air reduction

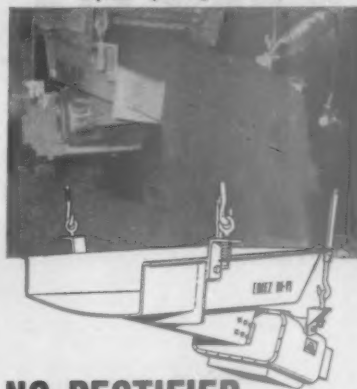
AIR REDUCTION has issued a pocket-sized catalog that gives full information on stick electrodes for arc welding applications. The illustrated catalog presents the right electrodes for welding steels, cast iron and non-ferrous metals. A handy comparison chart of both mild steel and stainless steel electrodes permits ready selection of electrodes.

Enter 712 on Reader Card  
(Continued on page 158)



## ERIEZ Magnetic Minute

60 seconds that will help you improve operating efficiency.



## NO RECTIFIER NEEDED WITH ERIEZ HEAVY-DUTY VIBRATORY FEEDERS

AC powered Eriez Hi-Vi vibratory feeders move large tonnages of bulk materials with accurate control... more efficiently and economically. Illustration shows one of a number of Eriez units available for heavy feeding applications where big capacity and accuracy are essential.

Whatever your application, there is an Eriez electro-permanent magnetic feeder that will meet your exact needs. And you get this exclusive combination of advantages: No rectifier needed... AC operation. Totally enclosed drive element ideal for hazardous, dusty, wet and corrosive installations. New fibre glass springs assure superior performance and control... longer life because spring breakage is practically eliminated.

The full line of Eriez Hi-Vi vibratory feeders includes models with feeding capacities ranging from ounces to many tons per hours.

Write for descriptive bulletin to:

**ERIEZ MANUFACTURING CO.**  
202RB Magnet Drive, Erie, Pa.



**MAGNA-THOUGHT**  
Constant research, development and refinement are the keys to new and improved products. New and improved products are the keys to a company's growth.

*A. F. Israelson*  
A. F. ISRAELSON  
Chief Engineer



Enter 1468 on Reader Card

here's why

## MARIETTA

### cuts bulk storage costs

When you store bulk materials . . . you want a storage system that is safe, economical and fits your materials handling concept. Here's where Marietta comes in. Every Marietta Industrial Storage System is engineered to meet precise requirements. And yet, Marietta industrial silos have a built-in flexibility that allows for future use as well as present need. That's because Marietta applies more than 40 years of experience to every phase of planning, design, fabrication and construction.



Standard Industries' new Tulsa production system is built around these Marietta silos.

A Marietta System saves you money, too. It eliminates expensive bagging and ground storage losses. And, it works with any materials handling system to cut costly delays in moving materials to trucks, railroad cars or processing areas. Only Marietta makes four types of concrete staves to give you the silo that best meets your requirements. So, if you store bulk materials . . . consult Marietta for a system that's based on your own particular needs . . . you get fast design and quick erection, too. Write for our Industrial Storage Catalog today.

*Marietta* CONCRETE DIVISION

AMERICAN-MARIETTA COMPANY  
MARIETTA, OHIO

Branch Offices: Baltimore 21, Md.  
Charlotte 6, N.C.  
Jamestown, N.Y.  
Representatives in principal cities

Enter 1462 on Reader Card

## NEW LITERATURE

(Continued from page 157)

### Pinch valve system

MINE AND SMELTER SUPPLY CO. announces a new system for automatic opening and closing of pinch valves in an illustrated, 12-page catalog. This system consists of one or more pinch valves with a single, automatically operated hydraulic pump. The pump may be operated by electric motor or by air from normal plant supply system. One of the advantages of the system is the claimed flexibility of the controlled circuitry to meet any operating requirements. The valves may be the same, or different, size; they may be operated simultaneously or independently, and they may be coordinated and interlocked with other plant equipment to automatically control tank levels, rate of flow, etc. The pinch valve is available with sleeves made of rubber, neoprene and specially compounded rubber, in sizes from 1 to 14 in. I.D.; with line pressure ratings of 50, 100 and 150 psi., and temperatures to 200 deg. F.

Enter 713 on Reader Card

### HRB bulletin

THE HIGHWAY RESEARCH BOARD has published a bulletin entitled, "Preconditioning & Stabilizing Soils by Lime Admixtures." The 85-page booklet reports the research results of 5 studies on lime stabilization of soils, all given at the 39th Annual Meeting of the Highway Research Board.

These studies include: Lime Stabilization Using Preconditioned Soils, Lime Fixation in Clayey Soils, Improvement of Lime Stabilization of Montmorillonitic Clay Soils With Chemical Additives, Reaction of Hydrated Lime with Pure Clay Minerals in Soil Stabilization and Recent Soil-Lime Research at the Massachusetts Institute of Technology.

Enter 714 on Reader Card

### Dry material feeder

BIF INDUSTRIES has issued an illustrated bulletin describing the company's belt gravimetric feeder. The feeder has a feed rate of over 3,000 lb. per min. Wide range is obtained with a variable speed transmission. A heavy-duty belt with positive chain drive eliminates slippage and training. There is a sampling gate provided as standard equipment. The unit's mechanical controller provides correction to prevent belt load variations.

Enter 715 on Reader Card  
END

## THE RIGHT MACWHYTE WIRE ROPE & SLING FOR YOU

IS AS NEAR  
AS YOUR



CALL YOUR  
MACWHYTE DISTRIBUTOR

ASK ABOUT MACWHYTE'S  
NEW 7-FLEX® WIRE ROPE



**MACWHYTE**  
WIRE ROPE COMPANY  
2900 FOURTEENTH AVE.  
KENOSHA, WISCONSIN

WIRE ROPE MANUFACTURING SPECIALISTS SINCE 1891

Enter 1463 on Reader Card

FOR DEPENDABILITY  
PLUS ECONOMY  
REPLACE WITH

## INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on  
INDIAN BRAND  
MANGANESE STEEL



Shovel Dippers • Dipper Teeth  
Shovel Treads  
Crusher Jaw Plates  
Mantles • Concaves  
Bowl Liners • Roll Shells  
Pulverizer Hammers  
Grate Bars • Breaker Plates  
Ball Mill Liners • Screen Plates  
Misc. Manganese Steel Castings

THE FROG, SWITCH AND  
MANUFACTURING COMPANY  
Carlisle, Pennsylvania • Established 1881

Enter 1464 on Reader Card

# Re-Usable Armco Corrugated Steel Structures Are Sturdy, Economical



**Sturdy**—Conveyor tunnels made of Armco MULTI-PLATE® or Liner Plate easily withstand the tremendous weight of aggregate piles. They gain their strength from material properly compacted around them. They won't crack or break.

**Economical**—With either Liner Plate or MULTI-PLATE your own crews can quickly bolt the plates together. The structural bolts make ideal utility line hangers. Hoppers are easy to install. And you can relocate any Armco Structure . . . many times over.

For complete information on the economy of Armco Corrugated Metal Structures, just fill in and mail the coupon. An Armco Sales Engineer will provide it with no cost or obligation to you.



For rugged,  
economical  
service



## Drainage & Metal Products

Armco Drainage & Metal Products, Inc., 5201 Curtis Street, Middletown, Ohio

☐ Have Armco Sales Engineer Call

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

TITLE \_\_\_\_\_

STREET \_\_\_\_\_

CITY \_\_\_\_\_

ZONE \_\_\_\_\_ STATE \_\_\_\_\_

Enter 1496 on Reader Card

ROCK PRODUCTS, April, 1961

159

## NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



### Variable wheel-base dump trailer

Largest unit in this maker's line is a new 37-cu. yd., 55-ton variable wheel-base dump trailer. The TS-3755 rig is adaptable for use with any suitable two-axle tractor. Since the over-all dimensions of the trailer and the design of the draft beam will vary according to the tractor, the new trailer will be built to order only.

Special high-strength alloy steels are used in the body and frame. This gives resistance to shock and abrasion when being loaded with heavy abrasive rock by big shovels. As the body is raised to end-dump position, the wheel base shortens automatically. This has the advantage of increasing maneuverability in tight working areas. Free discharge of the load is assured since the lip of the body in dumping position extends well beyond the tires. (Easton Car & Construction Co., Easton, Pennsylvania)

Enter 300 on Reader Card

### Vibrating screens

A new line of custom-assembled vibrating screens offers exceptional efficiency with low investment and maintenance costs. The Rumba screen is built for specific applications and includes a correctly sized vibratory unit, engineered design of feed and discharge chutes and a selection of frequency and amplitude to achieve maximum screening efficiency. This results in a minimum of vibra-

tion in the screen frame and elimination of destructive screen flexing and whipping. The rubber-mounted screen assembly provides ample screen vibration and long life for the unit. (The Hutchison Mfg. Co., P. O. Box 9335, Houston, Texas)

Enter 301 on Reader Card

### Mild steel welding

Sound, spatter-free welds are possible on mild steel with a new welding process called the CO<sub>2</sub> Sprayarc. These are achieved with the use of low cost carbon dioxide gas and a newly developed low alloy steel A602 Aircomatic welding wire.



The new wire can be used for single or multi-pass applications to weld mild steel. Deposition rates vary between 7 and 15 lb. an hr., depending on wire size and amperage. (Air Reduction Sales Co., 150 E. 42nd St., New York, N.Y.)

Enter 302 on Reader Card

### Insulating firebrick

A new line of insulating firebrick features lightweight, high porosity and superior materials that makes it suitable for high-heat locations. These brick are designed to cover service temperatures in the range between 1,600 and 2,900 deg. F. and to withstand direct exposure to flame and heat without spalling. (Kaiser Refractories & Chemicals Div., 300 Lakeside Dr., Oakland 12, Calif.)

Enter 303 on Reader Card

Please turn to page 162

TROJAN SAFETY CURVE LIFT ARMS

**BUILT  
AS ARMS  
SHOULD  
BE...**



**Only Trojan's  
box-type construction gives  
greater strength & capacity.**

Many times stronger than single plate construction, Trojan's box-type design produces higher resistance to torsional loads and, with the tubular cross member, minimizes normal working stresses — results in more even load distribution. All fittings and couplings are exposed and easily accessible for faster maintenance. The safety curve box design with internal linkage assures greater operator protection — yet allows full visibility for fast, continuous production . . . Let the many advantages of Trojan's high performance design cut your operating and maintenance costs. Ask your local distributor for a feature by feature inspection.

**TROJAN<sup>®</sup>**  
TRACTOR SHOVELS  
**YALE & TOWNE**

THE **YALE & TOWNE** MANUFACTURING COMPANY  
**TROJAN DIVISION**  
**BATAVIA • NEW YORK**

SEVEN MODELS TO CHOOSE FROM, 7,000 LBS. TO 24,000 LBS. CAPACITY



## NEW MACHINERY

*continued from page 160*



### Wheel scrapers

Two new models of wheeled tractor scrapers are available. Each features 420-hp. engines with torque divider power shift transmissions. The 630A is a 4-wheel unit, while the 631A is a 2-wheel drive unit.

Scrapers for both models are of the maker's Lowbowl design, while the tractors for both are powered with a diesel engine of completely new design. Top speed of the 630A is 41 mph. and of the 631A, 31 mph.

Primary advantage of the new units is the power shift transmission that is matched to the power characteristics of the new engine. To best meet power requirements, the engine has two governor balance points to give high horsepower at the automatic shift points.

Three drive ranges can be selected manually. Within each range, an automatic shift selects the most effective drive—torque divider, direct or overdrive. A dash-mounted indicator shows the operator when to shift manually to the next speed range. A special setting permits matching scraper speed to power requirements during the loading cycle. (Caterpillar Tractor Co., Peoria, Ill.)

*Enter 304 on Reader Card*

### New rotary drill rigs

Two powerful drill rigs offer the rock products producers rotary drills to make blast holes between 3 and 7 $\frac{3}{8}$  in. diam. These two units are designated LRD-2 and LRD-3 and are available with truck, crawler or wheel mounting for either rotary or down-hole drilling.

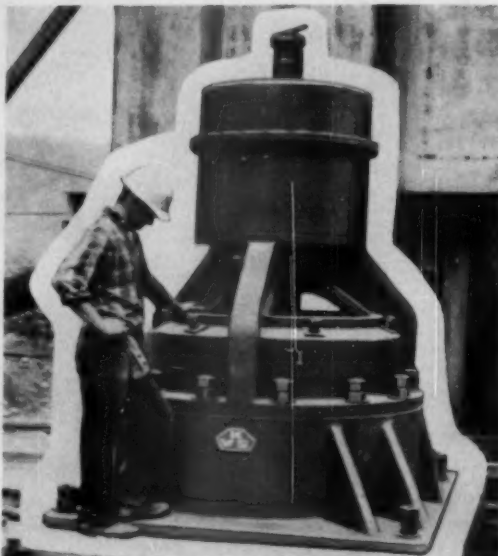
The LRD-2 is a one-man rig that drills a hole between 3 and 4 $\frac{1}{2}$  in. diam. to 25 ft. deep without changing pipe. Holes to 100 ft. deep can be made by adding pipe. For down-hole drilling, the rotary table can be raised about 16 in., and up to 10,000 lb. pressure is applied with the unit's pulldown.

The LRD-3 can exert up to 9,000 lb.-ft. torque to make a 6 to 7 $\frac{3}{8}$ -in. hole. A safety cutout prevents the engine from transmitting any greater

torque. Tricone bits are used for rotary drilling, and down-hole tools are offered for extremely hard rock. This rig is equipped with a special breakout mechanism and pipe tongs. Four lengths of 20-ft. pipe are carried in a pipe rack and they can be selected and positioned over the hole hydraulically. (LeRoi Division, Westinghouse Air Brake Company, Sidney, Ohio)

*Enter 305 on Reader Card*

### Automatic cone crusher



Kon-O-Matic is the name of a completely new cone crusher with an automatically controlled adjustment. It is said to offer important new advantages for secondary and tertiary crushing.

The automatic device provides instantaneous, finger-tip adjustment without stopping the unit, and an automatic release for protecting the crusher against tramp iron. At the same time, the control assures that the setting will return to the original position after each release. The device quickly unloads the crusher bowl to provide immediate start-up after power failure.

The new crusher is a compact unit with low headroom requirements in all sizes. All have positive pressure lubrication with safeguards that signal low oil pressure or excessive bearing temperature. Five sizes are available to offer crushing capacities between 8 and 950 tph. (Kennedy Van Saun Mfg. & Engr. Corp., 405 Park Ave., New York 22, N.Y.)

*Enter 306 on Reader Card*

*Please turn to page 164*

# NEW WEMCO LOG-WASHER *solves* *coarse aggregate washing problems*



## *Spiral off-set paddle design provides major breakthrough for handling hard-to-clean deposits.*

This latest addition to the WEMCO line is more than just another Log-Washer. Field-proved features make it the most economical, easiest to operate and most effective machine for eliminating clay balls, agglomerations, soft fractions and coatings from coarse aggregates.

Key to its unique performance: WEMCO's specially-developed spiral off-set paddles which mesh in sequence, provide continual scrubbing action of material—without load shocks or power peaks. Scrubbing effect and capacity are greater—with less power required.

Other features: two-piece replaceable transport action paddles; improved self-supporting modular tank design with large clean-out doors; modern oil bath drive mechanism; externally-mounted lower bearings.

The new WEMCO Log-Washer promises substantial savings in your operation—in the toughest coarse aggregate washing problems.

Call your nearest WEMCO representative for complete information—or write direct to:

**W E M C O**

® a division of

**Western Machinery Company**  
650 Fifth Street • San Francisco, Calif.



Combined action of spiral off-set and pitched paddles increases effective scrubbing.



WEMCO's drive mechanism is designed to eliminate problems associated with this type of unit. Logs are chain driven, gears and pinions of twin drive-shafts are synchronized. Lubrication of drive mechanism is effected by totally-enclosed oil bath.

In Canada: Western Machinery Company (Canada) Ltd. • 129 Adelaide Street, West . . . Toronto, Ontario



Kiln tires, such as shown above, up to 14'-0" x 27", are cast in 4 pieces at the Bethlehem Foundry and preassembled at the shop to assure accurate, economical reassembly in the field. Exceptionally accurate alignment is assured by the tongue and groove machining and the use of fitted pins in reamed holes at final assembly.

**BETHLEHEM**  
FOUNDRY & MACHINE CO.  
CEMENT MILL MACHINERY DIVISION  
225 W. SECOND STREET, BETHLEHEM, PA.

Enter 1454 on Reader Card



## SPEED SENSITIVE SWITCHES

With 1, 2, 3, 4, 5 or 6 adjustable switches in the same size container illustrated.

Any drive mountings listed which would best fit the installation can be used with any of our speed switches. The GS model will accommodate a coupling, gear or a pulley for other means of driving.

Normal speed can be as high as 7000 RPM. Low speed setting can be as low as 200 RPM if the top speed is below 2500 RPM. A governor that will make contact at 20 RPM is available.

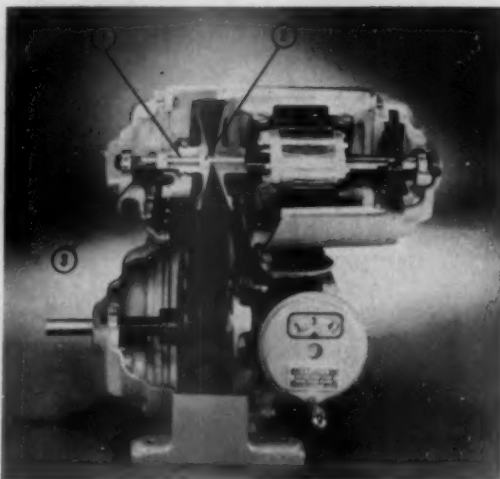
A variety of caps and terminals are available. Request Bulletin 604.

**SYNCHRO-START PRODUCTS, INC.**  
8131 N. RIDGEWAY AVE.  
SKOKIE, ILLINOIS

Enter 1455 on Reader Card

## NEW MACHINERY

continued from page 162



## Lube-free variable-speed drive

Lubrication problems in variable-speed drives have now been virtually eliminated. These drives can be mounted in inaccessible or inconvenient locations since lubrication is no longer necessary.

The new drive has fabricated plastic keys (1) that eliminate key and keyway wear; non-metallic bushings (2) that require no lubrication, and corrosion proof shafts (3) that need no oil protection. All anti-friction bearings in the unit have been lubricated and sealed at the factory so that they need no more lubrication.

Lube-free units are available in ratios up to 10 to 1 and in a range between 1/4 and 25 hp. All drip-proof, totally enclosed, fan-cooled and explosion-proof variable-speed models are furnished in this design. (Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.)

Enter 307 on Reader Card

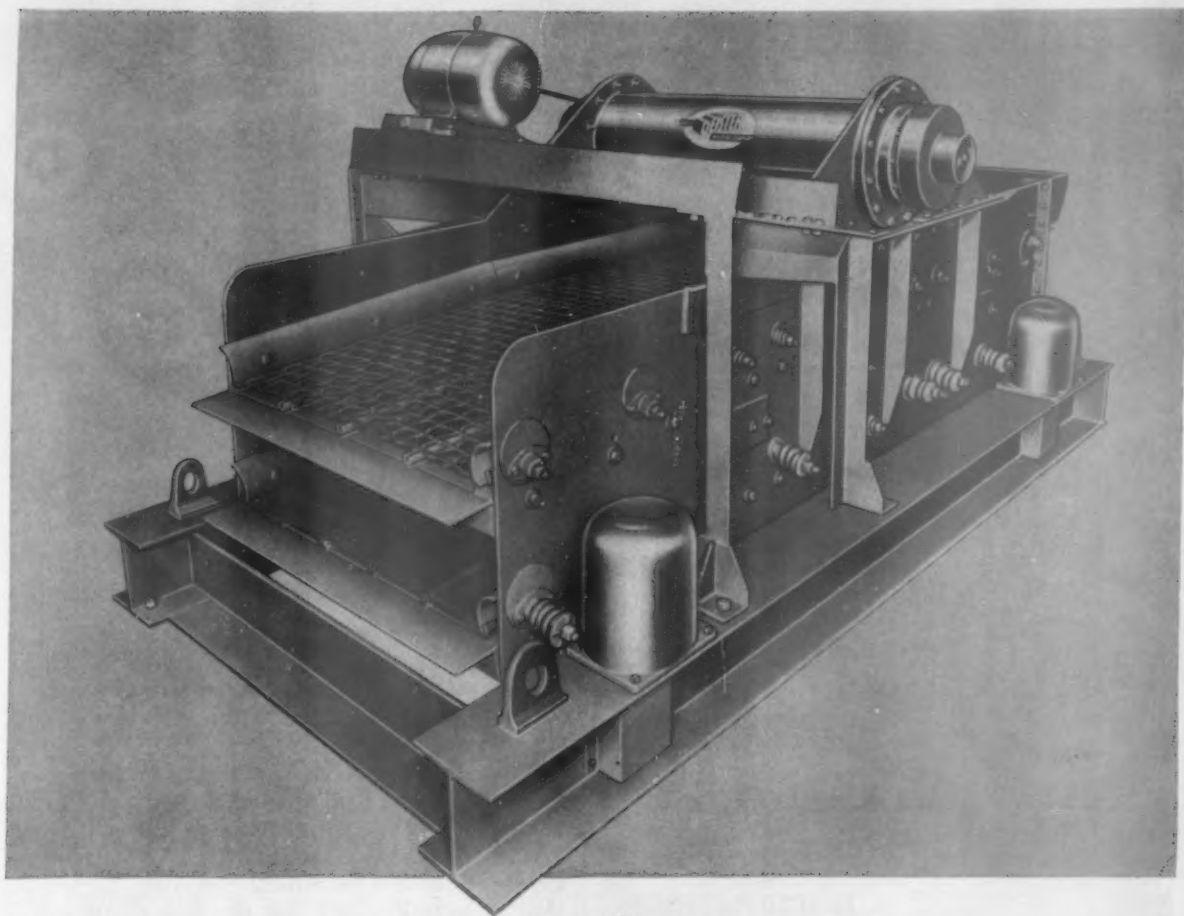
## Power shovel

Cement, clinker, lime, crushed stone and other granular materials may be handled by one man with this new automatic power shovel. While the machine has found its most useful application to unload bulk materials out of box cars, it may be rigged up to make small stock piles or to remove materials from stock piles into reclaim hoppers.

The mechanism is normally mounted on a rigid support about 10 ft. above grade and one can use an aluminum, wood or steel scoop to handle the materials. Maximum conveying distance is about 35 ft., but this can be extended on special models. (Webster Mfg. Inc., Tiffin, Ohio)

Enter 308 on Reader Card

Please turn to page 166



## Deister announces an all-new suspension system featuring ENCLOSED Spring & Rubber MOUNTS

"To provide the lowest cost per ton of material screened with the least amount of attention and downtime"—this has been the Deister objective throughout 35 years of vibrating screen manufacture.

In line with this objective, Deister Machine Company has now developed an all-new suspension system for the "live" or vibrating frame of its line of vibrating screens. It consists of a heavy H-beam stationary base on which are mounted ENCLOSED Spring and Rubber MOUNTS to carry the "live" frame.

The new mounts are located *outside* the side plates at the four frame corners. Each mount consists of a heavy coil spring working in conjunction with a solid rubber isolator *to eliminate completely* the transmission of vibration to the supporting structure.

Each mount is protected by an easily removed cover. Spring adjustment or replacement, if ever necessary, becomes a simple "wrench" job that can be done in a matter of minutes.

No extra cost is involved if cable suspension is desired. Cables can be

attached directly to the four lugs on the base. The effectiveness of the new mounts eliminates the need for cable suspension springs.

In order to simplify installation, Deister Vibrating Screens are supplied as a complete package instead of separate parts. The vibrating frame, stationary base, motor support and V-belt drive are assembled into a properly coordinated unit at the factory.

**DEISTER MACHINE COMPANY**  
1933 East Wayne St., Fort Wayne, Indiana



Enter 1501 on Reader Card

**T.C.**  
WRITE FOR  
CATALOG  
56

**DURABLE  
ECONOMICAL  
WOVENWIRE  
SCREEN  
KNOWN AROUND  
THE WORLD**

**TWIN CITY IRON & WIRE CO.**  
35 W. WATER STREET • ST. PAUL 7, MINNESOTA

Enter 1456 on Reader Card

## Slurries...handled at lower cost

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

**A. H. WILFLEY  
and SONS, Inc.**  
Denver, Colo., U.S.A.



Buy WILFLEY  
for Cost-Saving  
Performance

**WILFLEY**  
centrifugal PUMPS

Enter 1457 on Reader Card



Self-lubricated  
Nylon covered  
Hinge Pin

Enter 1458 on Reader Card

## HINGED PLATEGRIP

Recommended for mines, quarries, construction work, storage yards—wherever bolts length must be frequently changed. Hinged Plategrip Fasteners make a strong, flexible joint in heavy duty conveyor bolts, trough naturally, ride smoothly over pulleys, yet can be separated by simply pulling the hinge pin. Improved design takes the new smaller diameter self-lubricating nylon sheathed cable hinged pins. No. X500-1 single bolt fasteners and No. X500-3 3 bolt fasteners (used at outside edges) to reinforce edges and aid troughing.

Write for Catalog  
**ARMSTRONG-BRAY & CO.**  
5386 Northwest Highway  
Chicago, Illinois

## WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the "WHERE TO BUY" Section

## NEW MACHINERY continued from page 164



### Digging buckets for front end loaders

This manufacturer's complete line of rubber-tired tractor shovels, from largest to smallest, can now be equipped with Drott 4-in-1 patented buckets. Largest Payloader in the line will take a 4-cu. yd. bucket, while a 1-cu. yd. bucket is available for the smallest.

These buckets make it possible for any Payloader to do clamshell digging, scraping and grading, bulldozing and normal excavating and loading. With hydraulically operated jaws, these buckets give the operator exceptional flexibility to do jobs that otherwise would call for specialized equipment. (The Frank G. Hough Co., 400 Seventh Ave., Libertyville, Ill.)

Enter 309 on Reader Card

### Big log washer

This manufacturer's line of log washers has been extended to include a new model with 12-in. diam. logs. While it was developed especially for processing phosphate matrix, it is ideal for scrubbing large volumes of gravel, crushed stone and other heavy granular materials.

Principal features of the new log washer are a heavy-gauge steel plate washer box with an adjustable slope, square logs and paddles and cut-tooth spur gears running in an enclosed gear box. The 12-in by 30-ft. Mudmaster has a capacity estimated at 30 percent greater than the equivalent 10-in. model. (McLanahan & Stone Corp., Hollidaysburg, Pa.)

Enter 310 on Reader Card

### Water stemming bags

The advantages of water stemming for blasting can now be achieved with the use of flexible, self-sealing plastic bags. These bags are sealed at one end and are equipped with a special self-sealing

valve at the other. When filled with water, the tough, flame-resistant bags are about 15 in. long and are easy to handle and place in blast holes.

The manufacturer suggests that these water-filled stemming bags be placed just below and just above the explosive charge to achieve maximum effect. As a result, the amount of explosive may be reduced or the distance between holes may be increased. In addition, there is an appreciable reduction in the amount of visible dust and explosive fumes.

These plastic bags are supplied in strips of 40 which are pulled apart at perforations just before use. Best results are obtained when the bags are filled with the manufacturer's pedal-controlled filling machine. (B. E. P. Industrial Equipment, 6346 W. McNichols, Detroit 21, Mich.)

Enter 311 on Reader Card

### Blasting machines

Two new electric blasting machines incorporate a number of important design features, including greatly reduced weight and size.

VME-Sr. is rated at 450 v. and weighs only 15 lb. It can handle 50 caps in straight series or straight parallel for primary blasts and 200 caps in series for secondary blasting.

VME-Jr. has a 225-v. rating and a weight of 8 lb. Its recommended capacity is 30 caps in straight series for primary blasting and 100 caps for secondary blasting.

An optional feature is a maintenance contract that permits each unit to be returned to the factory annually for inspection and overhaul. It also provides emergency service at moderate cost. (Vibration Measurement Engineers, Inc., 725 Oakton St., Evanston, Ill.)

Enter 312 on Reader Card

### Weighing, batching feeder

Large capacity, rapid weighing and batching of fine granular materials and dusts is possible with a newly developed scale system. Capacities up to 40 tph. are possible with an accuracy within plus or minus .1 of 1 percent.

The new weighing mechanism is said to be unaffected by abrasive materials, moisture, shock or temperature changes. As a result, it is suitable for handling cement, lime, silica sand, agricultural limestone, rock dust and other materials in the rock products industry.

In operation, a rotary feeder takes material from a storage bin and delivers it to a weighing bucket, nearly filling it. Then the feeder dribbles enough material to actuate a signal that stops the operation and opens the release gate. This dump cycle can be either manual or automatic. (Thayer Scale Corp., Pembroke, Mass.)

Enter 313 on Reader Card

END



**"WISH I'D  
BOUGHT  
THAT DAMN  
TORNADO  
TWO YEARS  
AGO!"**



That's a typical comment from owners of this amazingly efficient, amazingly low cost Square Impact Crusher.

Because the Tornado is doing things formerly called "impossible" even for machines costing five or ten times as much. It's putting operators of crushing plants using even the most abrasive materials, in position to under-sell competitors using ordinary equipment—and they make far higher profits at the same time.



### WHAT ARE YOU WAITING FOR?

Why not write or phone us NOW to get the facts about this amazing, patented Crusher? Or if you want the QUICKEST action, rush us a 200# sample of your material, with details of the kind of product you want turned out, and the number of tons per hour you can use. We'll run it through a Tornado and give you full information on results. No obligation—and you'll be delighted with what you learn.

**TOM BRIDGEWATER**

**WERCO Steel Company**

2151 East 83rd Street, Chicago 17, Ill.

Phone ESsex 5-8446

Cable Address, IMPACTOR

Enter 1451 on Reader Card



HERE, a pilot test on the pelletizing characteristics and possible production rates of open hearth dust are conducted on a 39-in. disc at Dravo Corp.'s Research Center

## Pelletizing discs find ever-widening use

PELLETIZING DISCS, once utilized primarily for preparing iron ore or cement sinter mixes, are now being used successfully for the agglomeration of an ever-widening range of granular materials. The conversion of fines and powders of various types into pellets large enough for commercial use has been the object of more than four years of tests conducted by Dravo Corp., Pittsburgh, Pa. The tests already have established the practicality of pelletizing a number of materials previously regarded as waste products, and many future applications are expected. About 80 different

materials have been tested by the company, which manufactures and sells pelletizing discs under an exclusive licensing agreement with Lurgi Co.

The discs pelletize powdered materials by a rolling or "snowballing" action in which a small nucleus builds up in size as it travels around the disc, picking up fines that are fed onto the disc at a continuous rate. Water or some other liquid is added as a fine spray to dampen the powder and increase the tendency of the particles to adhere to one another. These discs are produced in standard sizes from 39 in. diam. to 16 ft. 5 in. diam.

## Battles succeeds Marbach

MR. RICHARD F. BATTLES has been elected to the position of vice president in charge of engineering of The Thompson & Litchner Co., Inc., consulting engineers of Brookline, Mass. He is a graduate in civil engineering of Northeastern University and also studied at Virginia Polytechnic Institute, Rutgers University and the University of Michigan. Mr. Battles is taking the position formerly held by Henry A. Marbach who has retired from the company.

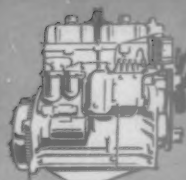
## Link-Belt promotes Wendell



ERWIN A. WENDELL has been appointed manager of advertising and public relations for Link-Belt Co., Chicago, Ill., it was announced by D. E. Davidson, vice president. The appointment follows the retirement of Bertram V. Jones, advertising manager for the past 10 years and a member of the advertising department since 1923. Mr. Wendell joined the company's engineering department in 1917. He entered the sales department in 1921. He joined the executive sales division in 1953, engaging in market research and sales analysis.

(Continued on page 170)

*The first really new  
crawler that  
cuts downtime  
... increases  
working time*



**PROVEN, TOP-FLIGHT POWER** — Case-built diesel is proven in millions of hours of field use. Torque converter automatically adjusts speed and power to load and footing... provides an infinite number of speeds down to 0 mph... delivers to 23,000 lbs of drawbar push-pull.

**POWER-TILTING BLADE** — A touch of a lever tilts blade to either side, on the go. The 750 is also available as power-angling dozer or as  $1\frac{1}{2}$ -cu yd tractor-shovel.

## NEW CASE 750

**...has new strength and stamina  
...is amazingly easy to service  
...gives you more time on the job!**

In the 750 you get *even more*... a tractor that's sized right, priced right and powered right... has "big rig" features... cuts downtime three ways!

### 1. Rugged, shock-absorbing construction

The 750 features exclusive main-frame with independently mounted major components, flexplate shock-absorbing drive between engine and torque converter, plus torsion-bar suspension, which also absorbs shocks and strains *before* they reach engine, transmission or final drives. And, the track system gives up to twice the *work life* of ordinary tracks.

### 2. Simplicity of service

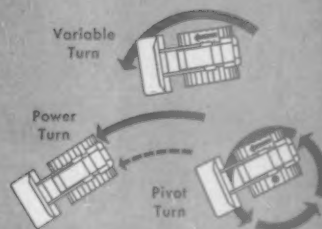
Most repair work on the 750 can be handled on the spot, by one man using ordinary hand tools. But should major repair work be required, downtime is further reduced because transmission, torque converter and other components can be quickly "pulled" and replaced without tearing down the entire machine.

### 3. Daily maintenance time cut by up to 50%

A number of the usual daily maintenance jobs have been eliminated in the design of the 750 while others have been greatly simplified to add hours of earning time to the normal work week. Danger of breakdowns due to lack of scheduled maintenance is minimized, assuring you of further profitable working time. (For example, hydraulic track adjustment, easily accessible filters, hinged grille guard.)

For complete details on how the Case 750 can help you build profit despite growing competition, see your Case Industrial Dealer. Or write Dept D1471, J. I. Case Co., Racine, Wis., for free literature.

CT-D-566R



**EXCLUSIVE TERRAMATIC® TRANSMISSION** — Eliminates clutching, shifting, stalling. Provides choice of "on a dime" pivot turns... gradual turns with one track in neutral... power turns with one track in high, one in low for trailing heavy loads downhill and working across rough ground, slippery slopes.



**EFFORTLESS OPERATION WITH HYDRAULIC CONTROLS** — A novice will be producing like an "old pro" in just a day or two. Three simple hand levers, foot throttle and brakes control all tractor movement. Right hand is free to control equipment.

**CASE.**  
J. I. CASE CO., RACINE, WIS.

## MANUFACTURERS NEWS

(Continued from page 168)

### Proposed merger approved

THE PROPOSED MERGER of Atlas Powder Co., Wilmington, Del., and The Stuart Co., Pasadena, Calif., has been approved by the boards of directors of both firms. The merger would involve a four-for-one split of the Atlas stock. Announcement of the boards' approval was made jointly by Ralph K. Gottshall, Atlas president, and Arthur Hanisch, president of Stuart Co.

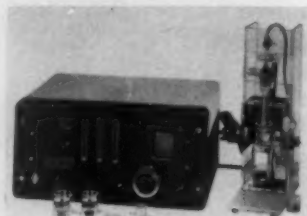
Atlas manufactures chemicals and explosives and sells them in both domestic and international markets; The Stuart Co. manufactures ethical pharmaceuticals which it distributes throughout the United States. Under the proposed merger, Stuart would operate as The Stuart Div. of Atlas.

### General Kinematics locates in Barrington, Ill.

GENERAL KINEMATICS CORP., manufacturers of vibratory process equipment, announces the selection of Barrington, Ill., as headquarters. Here,

the company's general offices and engineering facilities are located. Marvin Thompson, vice president, is in charge of engineering and production. The company is introducing a new line of vibratory feeders that are specially designed for efficiency in handling materials at either a fixed rate or infinitely variable rate in quantities up to 750 tph.

### Coulter counter wins John Scott award



THE COULTER COUNTER, electronic instrumentation that automatically counts and sizes fine particles, has won for its inventor, Wallace H. Coulter, Chicago, Ill., the John Scott award for scientific achievement. In many instances, the counter has enabled counting and sizing of fine particles never previously attempted as standard operating procedure. Mr. Coulter, vice president of Coulter Electronics was presented with a medal, a scroll and \$1,000 by James H. J. Tate, president of the Philadelphia City Council. The counter and its varied adaptations are manufactured by Coulter Electronics, 2525 N. Sheffield Ave., Chicago 14, Ill.

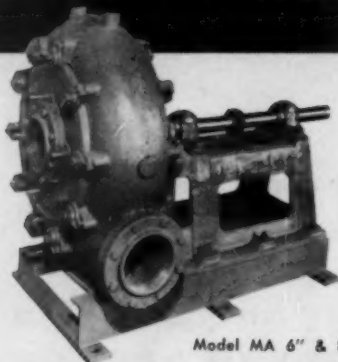
### Classifier awarded patent

A CLASSIFIER MODIFICATION designed by Wm. H. Reck, Western Machinery Co. consulting engineer, to improve dewatering of products, has been granted a U. S. Government patent.

Called the "beach effect," it is achieved by decreasing spiral diameter at the discharge end of the classifier and adding a special retaining plate at the discharge point. As the product is conveyed, an inclined beach is formed above the normal tank slope, between the point of decreased spiral diameter and top of the retaining plate. The extra slope of the beach allows more thorough drainage and removal of slimes from product before discharge. The product can be handled by normally inclined conveyors without slippage or loss. The classifier also enables more convenient closure with closed circuit grinding units.

(Continued on page 172)

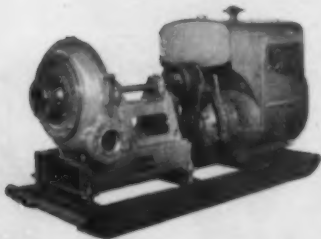
## PERFORMANCE-PROVED DESIGN for CONTINUOUS PEAK DELIVERY



Model MA 6" & 8"

### Compact Design... Rugged Construction

LIGHTNING Model MA handles large quantities of sand and gravel economically, up to a total head of 100'. Simple design makes it easy to maintain close internal clearances. Rugged construction withstands the shock of large solids passing through. Large, clean passages insure maximum and continuous delivery.



#### Available Mounted on Skid Base Complete with Gasoline Engine

Close coupled with V-belt drive. Either pump or industrial gasoline engine may be removed from the structural steel base for separate use. Model MA pump is light in weight and compact, for easy handling.

"Sixty years of service to the sand and gravel industry." We offer a complete line of pumps including rubber-lined and new ceramic-lined models. Write for complete information.

## The KANSAS CITY HAY PRESS COMPANY

801 Woodswether Road • Kansas City 5, Missouri

Enter 1447 on Reader Card

# EXTRA



## LARGE GRATE AREA AND AGGRESSIVE SCREENING ACTION GIVES UNIVERSAL'S HAMMERMILL SECONDARY CRUSHER EXTRA CAPACITY

Universal has developed a secondary crusher that *produces more road rock and/or asphalt mix aggregate per hour at a substantially lower operating cost.* There are two keys to Universal's Hammermill Secondary Crusher's *Extra* capacity:

First, Universal's giant grate area with more grate openings permits the bigger hammers to reduce more rock . . . to discharge freely, rapidly.

Second, Universal's Screenmaster with aggressive screening action provides full screening area on both decks. You get faster more thorough gradation, regardless of the material

being produced. Furthermore, extra-wide conveyors keep the greater production moving rapidly.

Universal offers a wide range of grate combinations with breaker plates designed for close positive control of product. You select from three types of hammers in two or three rows.

Yes, the Universal Hammermill Secondary Crusher has *Extra* capacity . . . *Extra* production . . . no congestion or excessive fines.

To see for yourself the *Extra* dollar benefits of greater production at a lower operating cost, contact your Universal distributor.



## UNIVERSAL ENGINEERING CORPORATION

617 C Avenue N.W., Cedar Rapids, Iowa

A Subsidiary of Pettibone-Mulliken Corporation, 4700 W. Division St., Chicago 51, Illinois

## MANUFACTURERS NEWS

(Continued from page 170)

### Process Equipment Manufacturers Assn.

THE FORMATION OF the Process Equipment Manufacturers Association was announced following the annual meeting held on January 12 at the Harvard Club, New York. One of its principal purposes is to assist its member companies in improving the efficiency of their operations and to render increased services to customers. J. D.

Hitch, Jr., director of Dorr Oliver Inc., is president, and Harlowe Hardinge, president of Hardinge Co., is vice president. R. P. Kite is executive secretary-treasurer.

The executive committee is composed of: Calvin A. King, president, Bird Machine Co.; P. H. Mulcahy, Mgr., Wemco Div., Western Machinery Co.; Harold M. Soars, president, Sprout, Waldron & Co.; A. L. Bolton Jr., treasurer, John W. Bolton & Sons; A. J. Chubb, general manager, Raymond Div., Combustion Eng. Inc.; H. J. Douglas, general manager, Pennsylvania Crusher Div., Bath Iron Works; H. I. Edwards, vice president, Pfau-

ler-Permutit, Inc.; Milton Spiegel, general manager, Chicago Pump Div., Food Machinery & Chemical Corp., and E. C. Swift, president, The Sharples Corp.

### New line of V-belt drives

TO PROPERLY SUPPLY the needs of the replacement market and of the increasing number of small equipment and component manufacturers using compact drives, Raybestos-Manhattan Inc., Passaic, N.J., has completed plans to sell its new V-belt drive through industrial distributors. During its introductory period, this drive was sold only through equipment manufacturers. Now, both belts and sheaves will be carried by distributors.

The light-duty, single-belt drive, which can operate on short centers and over sheave diameters as small as .8 in. PD, will be made available "off-the-shelf" for applications ranging from 1/40 to 15 hp. With the regular heavier-duty sections, the distributors will now be able to provide drives to 250 hp. from stock, and to 1,700 hp. on order. These sections replace 8 conventional V-belt sections.

### Union Wire Rope merges with Armco

UNION WIRE ROPE CORP., Kansas City, Mo., a wholly owned subsidiary of Armco Steel Corp. for the past three years, has been merged with the parent company in a move designed to simplify and strengthen the corporate structure of Armco. Union will continue to operate as a separate unit, and all sales activities will continue with the same policies and same personnel as in the past. James H. Hatch, who has been president of Union, will continue as general manager with the same responsibilities. Geo. P. Lacy will continue to direct the company's sales organization. Union Wire Rope Corp. was started in 1927.

### Crawler tractor film

A 20-MIN., FULL-COLOR movie featuring the company's OC-9 and OC-96 crawler tractors has been produced by the Oliver Corp., Chicago, Ill. Titled "A Prime Move Forward," the 16mm film reports on the engineering and design features of these tractors. The film takes the viewer through typical loading operations with the 1-yd. OC-96 loader and puts the stop watch on the various cycles in the loading operation. A direct running narration tells the OC-9 story in nontechnical language.

END



(Left)  
Two Type DC  
12'x60"  
double-deck  
Kolman screens  
making crushed  
granite  
separations

## KOLMAN Low-Cost Design Delivers More Screening Efficiency

Kolman packs terrific screening capacity into a minimum of space. Both portable and stationary installations are simplified by Kolman's compact design. Larger screens can be placed in limited areas. And this simple, effective design keeps prices reasonable and cost of operation normal.

### BIGGER PRODUCTION

The location of the vibrator mechanism varies according to the length of the screen, assuring that full vigorous vibrations are delivered uniformly to the complete screen load. It effectively reduces "blinding" and clogging. The even radial load on the bearing results in longer life, trouble-free operation.

### 'FLOATING ACTION'

Kolman's unique spring suspension system gives the freedom of movement required for added capacity without transmitting vibrations to the frame or supporting equipment. Its smooth, efficient operation makes the screen seem to "float" while in action.

### RUGGED CONSTRUCTION

Hundreds of applications have proved the ability of Kolman Vibrating Screens to take all the abuse dished out by the toughest jobs. The Kolman design permits handling surge loads more effectively than positive eccentric type screens.

Before you make any screen installation in construction, mining, industrial or aggregate production, check to see how much more Kolman's "Floating Action" Vibrating Screens offer you now, and for years to come. Single, double, and triple-deck models in sizes from 4'x24" to 14'x60".

(Left)  
Type TC  
12'x48"  
triple-deck  
screen



SEE YOUR DEALER OR WRITE FOR LITERATURE TODAY  
**KOLMAN MANUFACTURING COMPANY**

4206 West Twelfth Street

Sioux Falls, South Dakota

Enter 1445 on Reader Card

# WHERE TO BUY

You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

## SELLING DIRECT FROM LOCATION

WHERE RECENTLY OPERATED  
CHOICE EQUIPMENT GOOD FOR  
CEMENT—CRUSHED STONE—  
SLAG GYPSUM—LIME—SAND—  
GRAVEL

## PRICED FOR QUICK DISPOSAL

- 3 Allis Chalmers (2 compartment) 7'x22' Compeb Mills with Mechanite liners; each directly coupled to 400 H.P. Motor.

- 1 Allis Chalmers 9'6" Continuous Ball Mill; or PRELIMINATOR with Mechanite liner; directly coupled to 400 H.P. Motor.

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Welded Shell  
6' x 48', 6' x 72', 8' x 60', 9' x 160', 10' x 78'  
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40 x 35 Cedar Rapids Hammermill  
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36" x 96" H.R. Vibrating Pan Feeder New  
6—30" x 32" Diag's Magnetic Head Pulleys  
3—200 HP & 160 HPSD. Otruwua Elec. Hoists.

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2 Amer. R20-60 Gonty 13' Boom  
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New Universal Screens in Stock.

250"—9" Screw Conveyor Complete with Ends,  
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Gyratory or Cone Crushers—Small—#322 Allis-  
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2' Symons Cone

Crusher in excellent condition

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10' x 11' x 175' Vulcan Kiln,  $\frac{1}{16}$ "  
10' x 78' National dryers,  $\frac{1}{16}$ "  
8'-8" x 70' Hardinge,  $\frac{1}{16}$ " welded  
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8' x 60' Davenport,  $\frac{1}{16}$ " welded  
8' x 56' rotary kiln,  $\frac{1}{16}$ " welded.  
8' x 40' Stearns-Roger dryers,  $\frac{1}{16}$ "  
7'-6" x 100' kiln,  $\frac{1}{16}$ " shell.  
7'-6" x 62' kiln,  $\frac{1}{16}$ " welded  
7' x 60' Bonnet dryer,  $\frac{1}{16}$ "  
7' x 54' Vulcan dryers,  $\frac{1}{16}$ " shell.  
6' x 7' x 100' kiln,  $\frac{1}{16}$ " shell  
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8' x 60' Davenport rot. dryers,  $\frac{1}{16}$ " welded, late model, complete!

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Symons 2' standard cone crusher  
Farrel 36" x 15" jaw crushers  
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Dixie #5060 hammermill, 300 HP  
Amer. #38-S rolling ring crusher

### JUST PURCHASED

Allis-Chalmers 5' x 5' ball mill, 75 HP.  
Hardinge 8' x 60" conical ball mill.  
Hardinge 8' x 48" conical pebble mill, 75 HP, with classifiers.  
Denver 4' x 10' rod mill, 60 HP.  
8' x 56' rotary kilns,  $\frac{1}{16}$ " welded.  
Rotex 40" x 84" 2-deck screen.  
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8' x 120' rotary kiln,  $\frac{1}{16}$ " shell.

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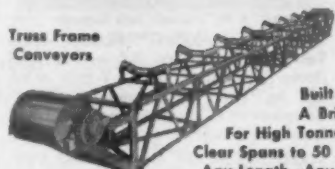
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Conveyor Prices Include Belting

Belt Width	Conveyor Length	Sale Price	Add or Deduct Per Foot
14"	25'	\$ 766	
14"	50'	1181	\$16.62
14"	85'	1763	
16"	20'	700	
16"	45'	1128	
16"	60'	1384	17.10
16"	90'	1897	
16"	150'	2923	
18"	25'	830	
18"	45'	1190	
18"	70'	1641	18.03
18"	85'	1912	
18"	100'	2182	
18"	130'	2723	
18"	200'	3985	
20"	25'	871	
20"	60'	1546	
20"	75'	1836	19.30
20"	90'	2125	
24"	25'	922	
24"	45'	1335	
24"	70'	1852	20.68
24"	100'	2472	
24"	120'	2884	
24"	150'	3507	
24"	200'	4540	
30"	50'	1591	
30"	70'	2054	
30"	90'	2518	23.17
30"	140'	3676	
36"	25'	1105	
36"	45'	1623	
36"	60'	2012	24.91
36"	100'	3048	

Other lengths and belt widths priced upon application. **BONDED 3" DEEP TRUSS CONVEYORS** also in heavy duty Portable Models. Available with Screen and Feeder and with mast or mastless type undercarriage and hydraulic powered mechanism. Lengths to 60 feet and belt widths through 36 inches. Equipped with Tow Hitch for easy moving from one job-site to another. **PRICED FROM \$3365.**

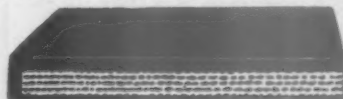
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WE PAY FREIGHT ON 200 POUNDS OR OVER.

QUANTITY DISCOUNTS ON 300' OR OVER UPON REQUEST

All belting is tested by the Engineering Laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

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**MAJOR BRAND:** 12" to 15" Friction Pull. 800# to 1000# Cover Tensile Heavy Duty. 28 oz. duck. 1/4" top x 1/4" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	U. S. Made Per Foot
14"	4	\$3.06
16"	4	3.21
18"	4	3.56
20"	4	4.11
24"	4	4.61
30"	4	5.64
36"	4	6.69

**MAJOR BEE BRAND:** 16" to 19" Friction Pull. 2400# to 3000# Cover Tensile. Skins Coat Between Plies. A high grade of heavy duty. 28 oz. duck with 1/4" top x 1/4" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	U. S. Made Per Foot	Special Imported Belt Per Foot
16"	4	\$3.74	\$3.23
18"	4	4.14	3.59
20"	4	4.72	4.15
24"	4	5.35	4.67
30"	4	6.56	5.75
36"	4	7.95	6.68
24"	5	6.25	5.41

### BONDED CONVEYOR PARTS

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Self Aligning Idler \$40.75

Heldback \$99.00

Wing Pulley \$39.00

### BONDED IDLERS & RETURN ROLLS FOR UTMOST ECONOMY



3-roll, 5" diameter Troughing Idlers for:

14" belt	\$19.75	24" belt	\$32.75
18" belt	20.50	30" belt	23.55
18" belt	21.90	36" belt	24.90
20" belt	23.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	\$ 8.50	24" belt	\$11.00
18" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable pre-lubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1188.**

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Fuller-Kenyon Conveying system pump type H3-7  
Fuller Kenyon Airslide cement conveying system  
Fuller Kinson Type V-200 Rotary Vacuum Pump  
Fuller Kinson Bulk Cement Type "D" Unloader  
with 1000 ft. pipe, 150 HP motor, two Fuller  
Compressors 7" type pump

### MILLS—CRUSHERS—KILNS—DRYERS

JAW: Bellanca, 14x24, Buchanan 18x36, 30x42,  
Type C 30x42, Cedar Rapids 20x36, Traylor 20x36,  
30x48, 30x72, Lippman 24x36, Universal 20x42;  
Superior McCully 42x40.

GYRATORY: Al. Chal. 8, 10", 16, Gates 12K;  
Traylor TS Kennedy Van Bean 35 1/2".

CONE: Symons 3", 4 1/4", 6 1/4", Roe-Ken 36";  
Traylor TV4; Telamith 3", 36", 55x30; Al. Chal.

ROLL: Cedar Rapids 6x16, 8x18, 10x16, 12x16,  
14x16, 16x16, Pioneer 40x22, 40x24 triple, 54x24;  
Telamith 40x22; Universal 30x18; Lippman 40x20.

MILLS—ROD—Donner 4x3, 4x10, Hardinge 4x10;  
Macer 2x3, 3x12.

TURB: Al. Chal. 6x22, Smith 5 1/4"x30, 6" 8"x31;  
Hardinge 4 1/4"x16" 8x18", 8x9", 8x36; 8x48; 10x48.

HAMMERMILLS: Penn SXT-250 HP motor, 6X16  
10"x16", Stodman 24x36, 30x42; Cedar Rapids

10-55, 30x36, 30x33, 30x18 double; Dixie 30x50.

AUTOCLAVES: J&C 6"x20" 8" dia. x 12"  
KILNS: 6"x30", 6"x120", 8"x160", 8"x128".

DRYERS: 6"x40, 6"x60, 8"x72.

BALL MILLS: 4 1/4"x16", 8"x36", 8"x18"

### CRUSHING PLANTS

Pioneer Port. 2436 jaw 4022 twin roll 36"x30" apron  
feeder, Murphy Diesel.

Universal 4034 roll port. Diesel, New 1958.

C-R 2236 jaw, Port. double deck grizzly, Diesel,  
heavy duty feeder.

Diamond Port. 3036 jaw, Heavy tandem,  
C-R 2236 Port. 125 HP motor.

C-R 3A-GB Port. 2236 jaw Diesel.

C-R 50" x 40" double Impeller Breaker, feeder,  
Universal 3042 jaw, 4024 roll Diesel Port.

### CONCRETE PLANTS

Johnson 150 ton 3 comp. aggr. cement 1500  
Noble CA-164-160 4 comp. 300 CP cement silo  
Johnson TY 400-300 yd bin 4 aggr. 1 cement.

Koehring mixer, 3 yd batcher.

Erle Strayer 120 tons aggr. bin, 850 bbls. cement  
Noble CA-354 4 comp. large capacity, Complete  
Smith 84-8 3 comp. Tilt-Mixer, 40 HP AC motor.

Johnson 300, TY-50, 300 yds; 3 comp. aggr.  
300 bbls.

### DREDGES

Morris 6" Diesel on 14"x36" hull

Elliot 14" x 12" Steel Hull 64" x 22" Diesel,  
10" Portable Diesel powered, Complete.

Amco 15" x 10" 10" Dis. Hull 24"x36" Diesel-Elec.  
Elliot 8" x 6" w/ cutter Diesel Hull 48"x18"x3' 6"

8" Hydraulic Diesel, On 22"x28" steel pontoons

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Tyler-Hummer 4'x10' one Deck

New Symons 5'x7' 5 HP Elec. Motor.

Simplicity 5'x14' double deck

Cedar Rapids 4'x12' 3 bl. deck 25 H.P. elec motor

Pioneer 5'x12' 3 deck 30 H.P. elec. motor

C-R 4'x14' 2 deck 25 HP motor

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236x714, 238x720, 240x726, 242x732, 244x738, 246x744, 248x750, 250x756, 252x762, 254x768, 256x774, 258x780, 260x786, 262x792, 264x798, 266x804, 268x810, 270x816, 272x822, 274x828, 276x834, 278x840, 280x846, 282x852, 284x858, 286x864, 288x870, 290x876, 292x882, 294x888, 296x894, 298x900, 300x906, 302x912, 304x918, 306x924, 308x930, 310x936, 312x942, 314x948, 316x954, 318x960, 320x966, 322x972, 324x978, 326x984, 328x990, 330x996, 332x1002, 334x1008, 336x1014, 338x1020, 340x1026, 342x1032, 344x1038, 346x1044, 348x1050, 350x1056, 352x1062, 354x1068, 356x1074, 358x1080, 360x1086, 362x1092, 364x1098, 366x1104, 368x1110, 370x1116, 372x1122, 374x1128, 376x1134, 378x1140, 380x1146, 382x1152, 384x1158, 386x1164, 388x1170, 390x1176, 392x1182, 394x1188, 396x1194, 398x1200, 400x1206, 402x1212, 404x1218, 406x1224, 408x1230, 410x1236, 412x1242, 414x1248, 416x1254, 418x1260, 420x1266, 422x1272, 424x1278, 426x1284, 428x1290, 430x1296, 432x1302, 434x1308, 436x1314, 438x1320, 440x1326, 442x1332, 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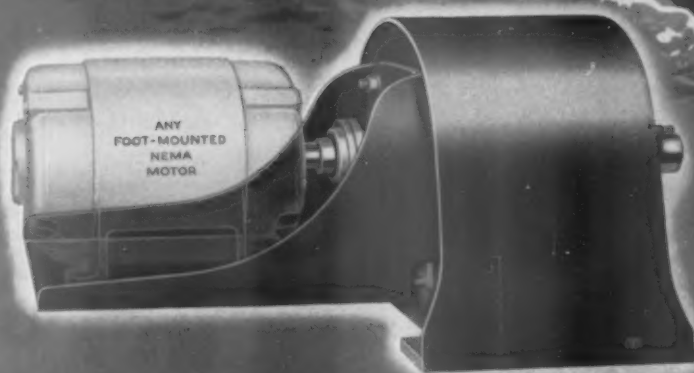
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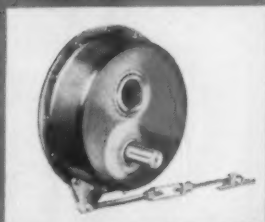
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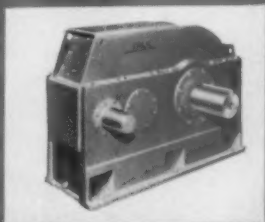
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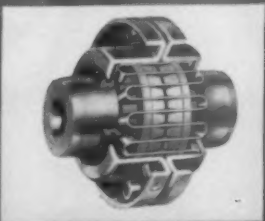
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